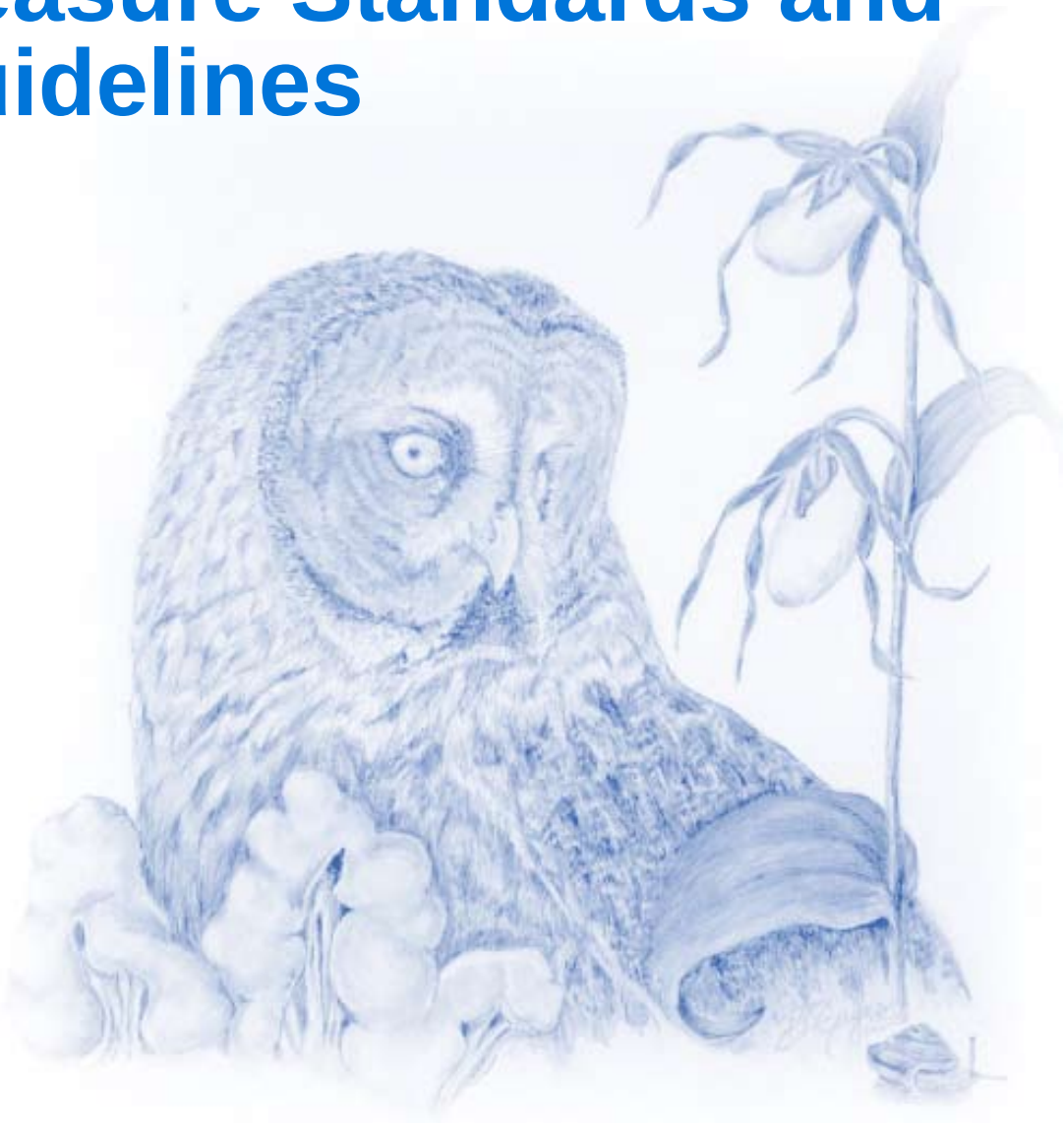
Draft Supplement

Draft **Supplement** to the 2004 Final SEIS

To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines



Forest Service National Forests in Regions 5 and 6
and Bureau of Land Management Districts
in Washington, Oregon, and California
Within the Range of the Northern Spotted Owl

Public Lands USA: USE, Share, Appreciate

BLM

Forest Service

July 2006

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

Cover artwork compliments of Elizabeth I. Gayner. Drawing includes the Great gray owl (*Strix nebulosa*), an orchid (*Cypripedium montanum*), a mushroom (*Gyromitra californica*), and a snail (*Monadenia fidelis*).

BLM/OR/WA/PL-06/37+1792

United States Department of Agriculture	Forest Service	R-6	OR/ WA	Bureau of Land Management	United States Department of Interior

Reply Refer To: 1950 (FS)/ 1736 (BLM) (OR-930) **Date: July 7, 2006**

Dear Reader:

Attached is the Draft Supplement to the 2004 Final Supplemental Environmental Impact Statement (FSEIS) To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. The Bureau of Land Management and Forest Service (the Agencies) prepared this Draft Supplement to address three deficiencies in the 2004 FSEIS identified by the District Court of the Western District of Washington. Any new information pertinent to the proposed action and the alternatives that has become available since the 2004 FSEIS has been added to this Supplement so that it contains the most current information.

You may wish to have a copy of the 2004 FSEIS so you can consider the Supplement in context. A copy is available on line at http://www.reo.gov/s-m2006 or may be requested in CD or printed version by writing to Kathy Anderson at U.S. Forest Service, P.O. Box 3623, Portland, OR 97208-3623 or emailing your request to ORSMSEIS@blm.gov.

The 90-day comment period begins with publication of the Notice of Availability in the *Federal Register*, expected to be on July 7, 2006, and is expected to close October 5, 2006. Changes in these dates will be published on the above website. The Agencies ask that those submitting comments on the Draft Supplement make them as specific as possible.

Reviewers should provide their comments during the comment period. This will enable the Agencies to analyze and respond to the comments at one time and to use information acquired in the preparation of the Final Supplement, thus avoiding undue delay in the decision-making process. Reviewers have an obligation to "'structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer's position and contentions.' Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 552 (1978)." Dept. of Transportation v. Public Citizen, 541 U.S. 752, 764 (2004). Therefore, environmental concerns that could have been raised at the draft stage may be forfeitED if not raised until after completion of the Final Supplement. Comments on the Draft Supplement should be specific and should address the adequacy of the Draft Supplement and the merits of the alternatives discussed (40 CFR 1503.3).

Comments received in response to this solicitation, including names and addresses, will be considered part of the public record on this Draft Supplement and are available for public inspection. Comments, including names and addresses, may be published as part of the Final Supplement. If you wish to withhold your name or address from public review, or from disclosure under the Freedom of Information Act (FOIA), you must state this prominently at the beginning of your written comments. Additionally, pursuant to 7 CFR 1.27(d), any person may request that submissions be withheld from the public record by showing how the FOIA permits such confidentiality. Persons requesting such confidentiality should be aware that under FOIA,

confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The requester will be informed of the Agencies' decision regarding the request for confidentiality. Where the request is denied, the comments will be returned to the requester, and the requester will be notified that the comments may be resubmitted with or without name and address. Comments submitted anonymously will be accepted and considered. Anonymous comments do not create standing or a record of participation. All submissions from organizations and business, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

For further information on this Supplement, contact Kathy Anderson, U.S. Forest Service-NR, P.O. Box 3623, Portland, OR 97208-3623; or via telephone at 503-808-2256.

Peggy Kain

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for MICHAEL S. MOTTICE
Deputy State Director for Resource
Planning, Use & Protection
Oregon/Washington
USDI Bureau of Land Management

1 Attachment
1 – Draft Supplement to 2004 FSEIS

Draft Supplement to the

2004 Final Supplemental Environmental Impact Statement

To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines

Forest Service National Forests in Regions 5 and 6
and Bureau of Land Management Districts
in Washington, Oregon, and California
Within the Range of the Northern Spotted Owl

July 2006

Lead Agencies: Forest Service - U.S. Department of Agriculture
Bureau of Land Management - U.S. Department of the Interior

Responsible Officials: Mike Johanns, Secretary of Agriculture
Dirk Kempthorne, Secretary of the Interior

Information Contact: Kathy Anderson
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P.O. Box 3623
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The Draft Supplement is available for public review for 90 days beginning with publication of the Notice of Availability in the *Federal Register*, expected to take place on July 7, 2006. Actual publication date will be noted on the web site below. Assuming publication on July 7, the 90-day public comment period would extend to October 5, 2006.

MAIL COMMENTS TO:
Survey and Manage SEIS Team
P.O. Box 2965
Portland, OR 97208-2965

Or submit them email to:
ORSMSEIS@blm.gov

Printed copies or a CD version of this document can be obtained by contacting Kathy Anderson at U.S. Forest Service, P.O. Box 3623, Portland, OR 97208-3623 or emailing ORSMSEIS@blm.gov. Copies of this document are also available on line at http://www.reo.gov/s-m2006.

Abstract

This Draft Supplement to the 2004 Final Supplemental Environmental Impact Statement (FSEIS) to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines provides additional analysis in response to three deficiencies identified by the District Court of the Western District of Washington, on August 1, 2005. To respond to the deficiencies identified by the Court, the Bureau of Land Management (BLM) and the Forest Service (the Agencies) have:

a. analyzed potential impacts to Survey and Manage species if they are not added to or are removed from the Forest Service's and BLM's respective programs for special status species;
b. provided a thorough analysis of their assumption that the late-successional reserves would adequately protect species that the Survey and Manage standard was introduced to protect, considering previous positions in earlier environmental impact statements, and;
c. disclosed and analyzed flaws in their methodology for calculating the acreage in need of hazardous fuel treatments. Revised the cost analysis was similarly flawed where it relied on the acreage in need of hazardous fuel treatments in calculating the cost of the Survey and Manage standard.

The Supplement also responds to new information about species and revises affected sections of the 2004 analysis. A new Record of Decision will be prepared following release of a Final Supplement.

The Purpose and Need, Proposed Action, and Alternatives remain unchanged from the 2004 document. The Agencies propose to remove the Survey and Manage Standards and Guidelines of the Northwest Forest Plan. For 52 of the 296 species analyzed, the analysis determined that while the Survey and Manage Program would provide sufficient habitat to support stable populations in the Northwest Forest Plan area, the proposed action would not. Another 11 species would not be stable in a portion of the range. Recognizing there is much that remains unknown about many of the species, for 131 species there would be insufficient habitat (including known sites) to support stable populations in the Northwest Forest Plan area under all alternatives due to factors beyond the control of the Agencies.

Alternatives 2 and 3 reduce fuel treatments costs and increased fuel treatment efficacy when compared to Alternative 1. Alternative 2 and 3 decrease annual timber production constraints by 70 and 60 million board feet per year, respectively when compared to Alternative 1.

Notice

Readers should note that the Secretary of Agriculture and the Secretary of Interior are the responsible officials for this proposed action. Therefore, no administrative review (appeal) through the Forest Service will be available on the Record of Decision under 36 CFR 217, and no administrative review (protest) through the Bureau of Land Management will be available on the Record of Decision under 43 CFR 1610.5-2. Because there is no administrative review of the decision, the Record of Decision will not be signed until 30 days after the Notice of Availability for the Final SEIS appears in the Federal Register (see 40 CFR 1506.10(b)).

Acronyms and Abbreviations

AMA	Adaptive Management Area
As	Bureau Assessment
ASR	Annual Species Review
BE	Biological Evaluation
BLM	Bureau of Land Management
BO	Biological Opinion
CEQ	Council on Environmental Quality
CVS	Continuous Vegetation Survey
ESA	Endangered Species Act
FEMAT	Forest Ecosystem Management Assessment Team
FIA	Forest Inventory and Analysis
FLPMA	Federal Land Policy and Management Act
FRCC	Fire Regime Condition Class
FSEIS	Final Supplemental Environmental Impact Statement
GeoBOB	Geographic Biotic Observations database
ha	hectare
ISMS	Interagency Species Management System database
MMBF	million board feet
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFPORS	National Fire Plan Operations & Reporting System
NWFP	Northwest Forest Plan
LSOG	Late-Successional and Old-Growth
O&C Act	Oregon and California and the Coo Bay Wagon Road Grant Lands Act
O&C lands	lands that are subject to the O&C Act
ONHP	Oregon Natural Heritage Program
ONHIC	Oregon Natural Heritage Information Center
PSQ	Probable Sale Quantity
RA	Rapid Assessment
RDS	Random Double Sample
RMS	Random Multi Species
REO	Regional Ecosystem Office
RIEC	Regional Interagency Executive Committee
ROD	Record of Decision
SE	Standard Error
SSSP	Special Status Species Programs(s)
SS	Forest Service or BLM Sensitive
USDA	United States Department of Agriculture
USDA	United States Department of the Interior
WFU	Wildland Fire Use
WUI	Wildland Urban Interface

How to Use This Supplement

This Draft Supplement is not designed for stand-alone use. It contains insert and replacement sentences, paragraphs, tables and one entire section for the 2004 Final Environmental Impact Statement (FSEIS), and is intended for use as a side-by-side supplement to that document. Unless otherwise changed or amended by this Supplement (other than minor edits of information obviously changed by the new information), information in the 2004 FSEIS continues to apply. The Purpose and Need, the Proposed Action, and the Alternatives described in the 2004 FSEIS all remain unchanged. Species outcomes and other effects remain unchanged unless specifically changed by this document.

The location where enclosed tables and text are to be inserted as additions, or treated as replacements, is described at the start of each new section or table in this Supplement. Page and section references are always assumed to be in the 2004 FSEIS unless stated otherwise. Heading levels and section titles in this Supplement are designed to match the 2004 FSEIS as closely as possible to avoid confusion and facilitate review. Reviewers needing a CD or printed version of the 2004 FSEIS may obtain copies by writing to Kathy Anderson at U.S. Forest Service, P.O. Box 3623, Portland, OR 97208-3623 or emailing your request to ORSMSEIS@blm.gov. A copy is available also on line at http://www.reo.gov/s-m2006.

Table and Figure Numbering

Table and Figure numbers that are whole numbers followed by an "S" (for Supplement) (e.g. Table 2-14S) supplement or replace the like-numbered tables in the 2004 FSEIS. Completely new tables and figures always include decimals, building on the nearest previous table in the 2004 FSEIS (e.g. Table 3&4-4.1S).

For the purposes of National Environmental Policy Act (NEPA) and Agency Planning Regulations, this document is itself a Draft Supplemental Environmental Impact Statement for Proposed Amendments to 28 Forest Service and BLM Land and Resource Management Plans, and applicable NEPA and Planning regulations apply. This Draft Supplement will be available for public review and comment for 90 days, after which the Agencies plan to issue a Final Supplement and then a new Record of Decision.

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Summary

Introduction

(At the end of this section on page xiii, insert:)

In January 2004, the Forest Service and Bureau of Land Management (the Agencies) issued a Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines (2004 FSEIS). A lawsuit by the Northwest Ecosystem Alliance and others resulted in an August, 2005 decision by the District Court of the Western District of Washington identifying three deficiencies in the analysis to which the Agencies are responding. The court found the Agencies had:

> 1. *"…failed to analyze potential impacts to Survey and Manage species if they are not added to or are removed from the Forest Service's and BLM's respective programs for special status species";*
>
> 2. *"…failed to provide a thorough analysis of their assumption that the late-successional reserves would adequately protect species that the Survey and Manage standard was introduced to protect, particularly in light of their previous positions in earlier environmental impact statements";* and,
>
> 3. *"…failed to disclose and analyze flaws in their methodology for calculating the acreage in need of hazardous fuel treatments. Part of the cost analysis was similarly flawed because it relied on the acreage in need of hazardous fuel treatments in calculating the cost of the Survey and Manage standard."* (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1197-98)

A Notice of Intent to prepare a Supplement to the 2004 FSEIS to address these three deficiencies was published in the *Federal Register* December 12, 2005. The Draft Supplement supplies only the missing information, as well as new information about species that has become available since the 2004 analysis. This 2006 Supplement and the 2004 FSEIS together present the environmental consequences of undertaking different management strategies for rare and little known species that are associated with late-successional and old-growth forests within the range of the northern spotted owl. This Summary addresses only the new information presented in this document.

What are the Effects of the Alternatives?

Survey and Manage Species

(Replace the last two and one-half paragraphs on page xv, and the first half paragraph on page xvi, with:)

The analysis determined Alternative 2, the proposed action, would not provide sufficient habitat to support stable populations for 51 of the 295 species analyzed, due to differences between Alternatives 1 and 2. This includes two lichens, ten mollusks, one bryophyte, and 38 fungi. For these species, there is sufficient habitat (including known sites) to support stable populations under Alternative 1 while there is insufficient habitat to support stable populations under Alternative 2. The difference in outcome for almost all of these species was caused by a species not qualifying for one or more of the Agencies' Special Status Species Programs in all or important parts of their range under Alternative 2.

The analysis determined Alternative 3 would not provide sufficient habitat to support stable populations for eight species in the Northwest Forest Plan (NWFP) area due to differences between Alternatives 1 and 3. This includes six fungi and two lichens. For

these species, there is sufficient habitat (including known sites) to support stable populations under Alternative 1 while there is insufficient habitat (including known sites) to support stable populations under Alternative 3. Under Alternative 3, the difference in outcome for almost all of these species was caused by a species not qualifying for one or more of the Agencies' Special Status Species Programs in all or important parts of their range.

For some of the species, even though they would have sufficient habitat (including known sites) to support stable populations range-wide in the Northwest Forest Plan area (or in most of its range in the case of red tree vole), they would have insufficient habitat (including known sites) to support stable populations in a portion of their range under Alternatives 2 and 3. For Alternative 2, this includes one lichen, two mollusks, one vascular plant, and six vertebrates. For Alternative 3, this includes one vascular plant and five vertebrates (See Table S-1S).

However, the analysis shows that Survey and Manage's "sufficient habitat" outcome definition, applied to species for which there is incomplete knowledge, does not necessarily correspond to Agencies' interpretations of legal requirements, particularly in light of very recent new information about habitat increases and emerging random sampling results. One species effects specialist (amphibians), for example, specifically notes the Survey and Manage standard for stable populations exceeds the 1982 National Forest Management Act (NFMA) viability standard. (There is no similar viability standard applicable to BLM O&C Act lands.) Analysis shows a 19 percent increase in late-successional forests in reserves since the Forest Ecosystem Management Assessment Team (FEMAT) did its original species ratings. Analysis also shows that older forest abundance, diversity, and connectivity are within the natural range of variability except perhaps for the provinces of the eastern Cascades, a condition the FEMAT estimated had a 77 percent chance of occurring within 100 years (USDA et al. 1993: IV-70). Ten year monitoring results appear to show that certain of the Northwest Forest Plan's assumptions were too conservative (Moeur et al. 2005).

The above-described effects for both Alternatives 2 and 3 assume that the Agencies will assign qualifying species to one or more of their Special Status Species Programs. While use of these programs is Agencies' policy and can be assumed, decision makers have considerable latitude regarding whether to assign specific species to these programs. Therefore, the effects of these alternatives are also described as if species are not assigned, or are removed from, these programs. For 64 species with habitat sufficient to support stable populations in all or part of their range under Alternatives 2 and 3, 21 outcomes remained unchanged with the removal of Special Status Species Program assignments in both alternatives. Under Alternative 2, removal of Special Status Species Programs assignment would change outcomes to insufficient habitat for 37 species in all of their range, and 6 species in a portion of their range. Under Alternative 3, removal of Special Status Species Programs assignment would change outcomes to insufficient habitat for 2 species in all of their range, and one species in a portion of its range (See Table S-2S).

Potential Species Mitigation

(Replace the second paragraph in this section, the second full paragraph on page xvi, with:)

There are 131 species (and one in part of its range) with insufficient habitat (including known sites) to support stable populations in the Northwest Forest Plan area under all alternatives. This predicted outcome is due to factors such as limited potential habitat, few known populations on federally managed lands, potential for stochastic events, low number of individuals, limited distribution, and narrow ecological amplitude. Since the insufficient habitat is not a result of federal actions, no alternative could be proposed that would change this outcome (USDA, USDI 1994a; USDA, USDI 2000a). There are 18 species and 4 arthropod groups for which there is insufficient information to determine an outcome under all alternatives.

Prescribed Fire

(Replace the three paragraph in this section, on page xvii, with:)

Under Alternative 1, the annual acres available for hazardous fuel treatments would be 146,060 acres. The cost per acre to manage for species would be $84.00.

Under Alternative 2, the annual acres available for fuel treatments would be 156,860, an increase of 10,800 acres compared to Alternative 1. Fuel treatment costs to manage for species would be $34.00 per acre, a decrease of $50 compared with Alternative 1. If this savings could be directly applied to additional fuels treatment, an additional 14,000 acres could be treated. Mitigation measures for 63 species under Alternative 2 would result in 200 fewer acres available for annual fuel treatments and an increase of approximately $3 per acre to protect species compared to Alternative 2 without mitigation.

Under Alternative 3, the annual acres available for fuel treatments would be 154,900, an increase of 8,840 acres compared to Alternative 1. Fuel treatment costs to manage for species would be $24 per acre, a decrease of $60 compared with Alternative 1. If this savings could be directly applied to additional fuels treatment, an additional 16,900 acres could be treated. Mitigation measures for 14 species under Alternative 3 would result in 300 fewer acres available for annual fuel treatments and an increase of less than $1 per acre to protect species compared to Alternative 3 without mitigation (See Table S-1S).

Cost of Management

(Replace the three paragraph in this section, on page xvii, with:)

Under Alternative 1, the Agencies' short-term annual costs would be $27.0 million. Long-term annual costs (after 10 years) would decrease to $17.6 million.

Under Alternative 2, the Agencies' short-term annual costs would be $10.5 million. This would result in a short-term cost savings of $16.5 million per year compared to Alternative 1. The Agencies' long-term annual costs would be $10.0 million. This would result in a long-term cost savings of $7.6 million per year compared to Alternative 1. The cost of mitigation under Alternative 2 would be $0.6 million dollars annually, mostly due to the need for additional clearance surveys.

Under Alternative 3, the Agencies' short-term annual costs would be $12.4 million. This would result in a short-term cost savings of $14.6 million per year compared to Alternative 1. The Agencies' long-term annual costs would be $10.8 million. This would result in a long-term cost savings of $6.8 million per year compared to Alternative 1. The cost of mitigation under Alternative 3 would be negligible (See Table S-1S.)

Socioeconomics

(Replace the second, third, and fourth paragraphs in this section, on page xvii and xviii, with:)

Under Alternative 1, the timber-related employment decrease from the Northwest Forest Plan harvest level would be 953. Survey-related employment would provide an additional 557 jobs. This would result in a net decrease of 396 jobs and a net loss in annual personal earnings of $18.3 million compared to projected employment under the Northwest Forest Plan.

Under Alternative 2, the timber-related employment decrease from the Northwest Forest Plan harvest level would be 318 jobs. Survey-related employment would provide an additional 216 jobs. This would result in a net decrease of 102 jobs and a net loss in annual personal earnings of $5.4 million compared to projected employment under the Northwest Forest Plan. Mitigation under this alternative would result in an additional decrease of 8

(Replace Table S-1 on page xix with Table S-1S below)

Table S-1S. Summary of environmental consequences of the alternatives.

		Alternative 1	Alternative 2	Alternative 2 with Mitigation	Alternative 3	Alternative 3 with Mitigation
Species and Groups	Insufficient habitat not due to federal actions [1]	131(1[2])	131(1[2])	131(1[2])	131(1[2])	131(1[2])
	Insufficient habitat due to actions under the alternative	0	51(10[2])	0	8(6[2])	0
	Sufficient Habitat	146	95	146	138	146
	Insufficient Information to Determine Outcome	18	18	18	18	18
Effect on Annual Timber Harvest (MMBF)		-105	-35	-35	-45	-50
Short-term Annual Cost (millions)		$27	$10.5	$11.1	$12.4	$12.5
Long-term (10 years) Annual Cost (millions)		$17.6	$10	$10.4	$10.8	$10.9
Employment Decrease From Full Harvest Level (per Northwest Forest Plan)		-953	-318	-336	-409	-445
Survey Related Employment		+557	+216	+226	+256	+258
Net Loss in Annual Personal Earnings (millions)		-$18.3	-$5.4	-$5.8	-$7.5	-$8.6
Hazardous Fuel Treatment (Annual Acres)		146,060	156,858	156,658	154,900	154,600
Hazardous Fuel Treatment (Cost to Protect Species/Acre)		$84.18	$34.10	$37.10	$23.78	$24

[1] Factors resulting in insufficient habitat are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, or narrow ecological amplitude.

[2] Species with sufficient habitat range-wide, but with insufficient habitat in a portion of the range. These are included in the "sufficient habitat" count.

jobs and an additional loss in annual personal earnings of $0.4 million when considering both timber and survey-related jobs.

Under Alternative 3, the timber-related employment decrease from the Northwest Forest Plan harvest level would be 409 jobs. Survey-related employment would provide an additional 256 jobs. This would result in a net decrease of 153 jobs and a net loss in annual personal earnings of $7.5 million compared to projected employment under the Northwest Forest Plan. Mitigation under this alternative would result in an additional decrease of 34 jobs and an additional loss in annual personal earnings of $1.1 million when considering both timber and survey-related jobs (See Table S-1S).

Which Alternative is Preferred?

(Replace the paragraph in this section, on page xx, with:)

Based on consideration of the environmental consequences described in the 2004 FSEIS and 2006 Supplement, Alternative 2 was found to best meet the purpose and need, and is the preferred alternative.

Table S-1.1S. *(New Table)* Summary of Environmental Consequences for the 145 Species Assumed to be on Special Status Species Programs

		Alternative 1	Alternative 2		Alternative 3	
			With SSSP	Without SSSP	With SSSP	Without SSSP
Species and Groups	Insufficient habitat not due to federal actions [1]	36([2])	36([2])	36([2])	36([2])	36([2])
	Insufficient habitat due to actions under the alternative	0	36([2])	73([2])	6([2])	8([2])
	Sufficient Habitat	100	64	27	94	92
	Insufficient Information to Determine Outcome	9	9	9	9	9

[1] Factors resulting in insufficient habitat are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, or narrow ecological amplitude.
[2] Species with sufficient habitat range-wide, but with insufficient habitat in a portion of the range. These are included in the "sufficient habitat" count.

(The Introduction section is new. Before Chapter 1, between pages xx and 1, insert:)

Introduction

Objective of this Supplement

The Forest Service and Bureau of Land Management (the Agencies) issued a Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in January, 2004. The Agencies followed with a Record of Decision in March, 2004 selecting Alternative 2, the Proposed Action, and began to implement that alternative. In October, 2004, the Northwest Ecosystem Alliance and others brought suit against the Agencies under the Administrative Procedure Act, alleging violation of the National Environmental Policy Act (NEPA), National Forest Management Act (NFMA), Federal Land Policy and Management Act (FLPMA) and the Endangered Species Act (ESA) and several other relevant land and species management statutes.

This Supplement addresses findings rendered by the United States District Court, Western District of Washington, in an order pertaining to Northwest Ecosystem Alliance, et al. *v.* Rey (August 1, 2005). The Court found the 2004 FSEIS deficient under the NEPA in three specific areas:

1. *"...Agencies' analysis of the environmental impacts of eliminating the standard is premised on an assumption that is inconsistent with their own prior analysis and therefore appears to lack support.....The Agencies have an obligation under NEPA to disclose and explain on what basis they deemed the standard necessary before but assume it is not now"* (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1192-1193) and the Agencies "*failed to provide a thorough analysis of their assumption that the late-successional reserves would adequately protect species that the Survey and Manage standard was introduced to protect, particularly in light of their previous positions in earlier environmental impact statements."* (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1198).

The Late-Successional Forest Ecosystems section in Chapter 3&4 has been supplemented. Also a new section called Survey and Manage Species has been added to discuss new information, rarity, and risk for Survey and Manage species. Additional information about the 2000 Final SEIS and the Northwest Forest Plan's objectives has been added to the section, *Relationship of this SEIS to the Northwest Forest Plan Final SEIS and the 2000 Survey and Manage Final SEIS*.

2. The Agencies failed to...*"analyze potential impacts to Survey and Manage species if they are not added to or are removed from the Forest Service's and BLM's respective programs for special status species."* (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1197).

The circumstance of the Agencies not assigning species to Agencies' Special Status Species Programs is addressed in this Supplement as "scenarios" under Alternatives 2 and 3, and not as new alternatives. Species effects under these scenarios are described in the text for each species, and displayed in tables, so decision-makers can understand the implications of exercising their discretion to not follow through on one or more of the FSEIS species assignments assumed in the 2004 FSEIS.

The effects of not assigning species to the Agencies' Special Status Species Programs are described in text for each of the 145 species assumed to be assigned to one or more of these programs according to Table 2-5 in the 2004 FSEIS. Resultant outcomes, by species, are displayed on Table 3&4-9.1S.

3. The Agencies *"failed to disclose and analyze flaws in their methodology for calculating the acreage in need of hazardous fuel treatments. Part of the cost analysis was similarly flawed because it relied on the acreage in need of hazardous fuel treatments in calculating the cost of the Survey and Manage standard."* (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1198).

A new Wildland Fire section is included in the Supplement. The section addresses new approaches to hazardous fuel reduction to reflect recent identification and national mapping of Fire Regime Condition Classes and the emphases of the National Fire Plan. Resultant changes in cost have been incorporated into the analyses in the *Costs of Management* and *Socioeconomic Effects* sections.

The Supplement also updates new information about species learned since completion of the 2004 analysis, changing species outcomes where significant new information indicates a change is indicated. The Supplement also provides additional analysis about late-successional forest ecosystems and about Survey and Manage species in general.

The information and analysis in this Supplement is presented as inserts to the 2004 FSEIS, either as replacement paragraphs or sections, or as additions to the existing text. To understand the entire analysis, this Supplement and the 2004 FSEIS should be considered together.

Specifically this Supplement provides:

a. Significant new information about the 295 species included in the Survey and Manage Standards and Guidelines, either as additions to, or replacements of, the existing (2004 FSEIS) analysis text.

b. Outcomes for 145 species under Alternative 2, and 15 species under Alternative 3, as if previously assumed Agencies' Special Status Species Program (SSSP) assignments were not made or were removed at this time.

c. A revised Wildland and Prescribed Fire analysis, and resultant table and text edits to the Cost and Jobs sections.

d. New information about the status of Late-Successional and other Reserves, as well as a discussion of the likely role of Survey and Manage species on ecosystem function.

e. Numerous tables showing either changes from 2004 tables because of new information or effects, or showing new information to respond to the deficiencies identified by the Court.

Subsequent Documents

Following a 90-day public comment period and issuance of a Final Supplement, the analysis presented in the 2004 FSEIS and the Supplement together will serve as the basis for a new Record of Decision.

Chapter 1

Chapter 1 – Purpose and Need

Introduction

Insert or replacement text, tables, and figures are provided below. Unless replaced as described below, existing text, figures, and tables from the 2004 FSEIS remain unchanged.

Scoping

(At the end of this section on page 11, insert:)

According to Council on Environmental Quality (CEQ) regulations, scoping is specifically not required for supplements to environmental impact statements (CEQ Regulations Implementing NEPA, 40 Code of Federal Regulations (CFR) 1502.9(c)(4)). The Agencies, however, did publish a Notice of Intent to prepare a Supplement to the 2004 Final SEIS in the *Federal Register* (70 FR 73483) on December 12, 2005. The Notice of Intent provided preliminary information about objectives of the Supplement and invited public comment. Two letters were received, one from the U.S. Environmental Protection Agency and one from the Oregon Natural Resources Council. Suggestions from both of these letters were incorporated into this Supplement.

(There are no other changes or additions to Chapter 1.)

Chapter 2

Chapter 2 – The Alternatives

Introduction

Insert or replacement text, tables, and figures are provided below. Unless replaced as described below, existing text, figures, and tables from the 2004 FSEIS remain unchanged.

Background for Survey and Manage Standards and Guidelines

The Northwest Forest Plan

(Replace the last paragraph in this section, the second full paragraph on page 16, with:)

The Northwest Forest Plan was based on the Forest Ecosystem Management Assessment Team (FEMAT) report. The FEMAT was chartered in April 1993 by President Clinton to write a scientifically based plan for "protecting the long-term health of our forests, our wildlife, and our waterways ... in balance with ... a predictable and sustainable level of timber sales and non-timber resources ..." within the range of the northern spotted owl (USDA, USDI 1994a:1-4). To meet this charge, the FEMAT was asked to develop *"alternatives that range from a medium to very high probability of ensuring the viability of species"* (USDA et al. 1993:iv). In addition to a no-action (no-change) option, the FEMAT developed nine options for meeting this charge. The nine options served as the basis for the alternatives presented in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a).

The Alternatives

Overview

(At the end of this section on page 25, insert:)

Agencies' decision makers, however, have broad latitude regarding the assignment of individual species to their Special Status Species Programs. For this reason, effects to species under Alternatives 2 and 3 as if they are not added, or are removed from, Agencies' Special Status Species Programs at this time are also displayed in Chapter 3&4 and summarized on tables in Chapters 3&4 and 2.

Elements Common to All Alternatives

Special Status Species Programs

(Replace bullet #2 on page 25 with:)

2. For analysis purposes, any species removed from Survey and Manage will be added to the Agencies' Special Status Species Program for which it is eligible (see Table 2-5 and 2-10). However, the effects to species if they are not added to, or are removed from, Agencies' Special Status Species Programs at this time are also displayed.

Legal Requirements

National Forest Management Act (16 U.S.C. §§ 1600-1614)

(At the end of this section, at the top of page 28, insert:)

The 2004 FSEIS applied the amendment process set out in the Forest Service NFMA planning rule issued in 1982 (36 CFR Part 219, See "36 CFR parts 200 to 299, Revised as of

July 1, 2000"). References in the 2004 FSEIS to provisions in 36 CFR Part 219 are to the 1982 planning rule. Since the 2004 FSEIS, the Forest Service has issued a new planning rule (70 Fed. Reg. 1022, January 5, 2005; see "36 CFR parts 200 to 299 Revised as of July 1, 2005"). However, as allowed by the 2005 rule, this amendment process uses the provisions of the 1982 rule, and all references in this Draft Supplement to provisions of 36 CFR 219 are to the 1982 rule.

The sections of the 1982 regulations which are particularly relevant to the analysis contained in this Draft Supplement are:

> *"36 CFR. 219.19. Fish and wildlife resource. Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.*
>
> *"36 CFR 219.26 Diversity. Forest planning shall provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area. Such diversity shall be considered throughout the planning process. Inventories shall include quantitative data making possible the evaluation of diversity in terms of its prior and present condition. For each planning alternative, the interdisciplinary team shall consider how diversity will be affected by various mixes of resource outputs and uses, including proposed management practices. (Refer to Sec. 219.27(g).)*
>
> *"36 CFR 219.27(g) Diversity. Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest and the diversity of tree species similar to that existing in the planning area. Reductions in diversity of plant and animal communities and tree species from that which would be expected in a natural forest, or from that similar to the existing diversity in the planning area, may be prescribed only where needed to meet overall multiple-use objectives. Planned type conversion shall be justified by an analysis showing biological, economic, social, and environmental design consequences, and the relation of such conversions to the process of natural change."*

The 1982 planning regulations may be viewed in their entirety at: http://www.fs.fed.us/emc/nfma/includes/nfmareg.html.

Alternative 2, Proposed Action (Northwest Forest Plan without Survey and Manage)

Standards for Inclusion

(In the first full paragraph on page 46, correct the table reference to "Table 2-5", and at the end of the paragraph, insert:)

In 2004, the Agencies added species to their respective Special Status Species Programs as assumed in the 2004 FSEIS analysis and displayed on Table 2-5, except as described below and displayed on Table 2-5S.

One of the fungi species, *Phaeocollybia californica*, was inadvertently omitted from Table 2-5. It should be listed in Special Status Species Programs for all Northwest Forest Plan BLM lands and Forest Service lands in Oregon.

For BLM OR/WA, the following species were not added to the Agency's Special Status Species Program:

- *Marsupella emarginata* v. *aquatica* (bryophyte) – meets the criteria for Bureau Assessment but not documented or suspected on BLM lands.
- *Orthodontium gracile* (bryophyte) – meets the criteria for Bureau Assessment but not documented or suspected on BLM lands.
- *Tritomaria quinquedentata* (bryophyte) – meets the criteria for Bureau Assessment but not documented or suspected on BLM lands.
- *Chroogomphus loculatus* (fungi) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Gastroboletus vividus* (fungi) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Macowanites mollis* (fungi) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Martellia fragrans* (fungi) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Cryptomastix hendersoni* (mollusk) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Hemphillia burringtoni* (mollusk) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Hemphillia malonei* (mollusk) - Oregon Natural Heritage Program (ONHP) program changed ranking from List 1 to List 4 which moved it from Bureau Sensitive to Bureau Tracking. Bureau Tracking species are not identified in this table.
- *Juga (O)* n. sp. 2 (mollusk) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Lyogyrus* n. sp. 2 (mollusk) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.
- *Mondadenia fidelis minor* (mollusk) – meets the criteria for Bureau Sensitive but not documented or suspected on BLM lands.

For Forest Service Region 6, the following species were not added to the Agency's Special Status Species Program:

- *Fluminicola seminalis* (mollusk) – species not documented or suspected to occur in Oregon; historic records based on misidentification.

For Forest Service Region 5, the following species were not added to the Agency's Special Status Species Program:

- *Gomphus bonarii* (fungi) – no longer meets the rarity criteria. The R-5 Sensitive Species consideration documentation shows in 2004 there were 65 federal known sites in California within the NWFP area, it was reported as common in the Sierra Nevada, and it was sufficiently represented in reserves to avoid management threats to its continued persistence.

Gomphus bonarii is a synonym *of Turbinellus floccosus* (Schwein.) Earle which is the correct name for *Gomphus floccosus* (Giachini 2004). *Gomphus floccosus* was removed from the Survey and Manage Program by the 2001 Annual Species Review. *Gomphus bonarii* is no longer considered a Survey and Manage species and is removed from further consideration in this Supplement.

These changes are reflected in the revised species effects discussions in Chapter 3&4 in this Supplement.

The effects to all species if they are not added to, or are removed from, Agencies' Special Status Species Programs at this time are also displayed.

Number of Species and Taxa

(At the end of the second paragraph in this section on page 47, insert:)

However, the effects to species if they are not added to, or are removed from, Agencies' Special Status Species Programs at this time are also displayed.

(At the end of Table 2-5 on page 58, insert:)

Table 2-5S. *Changes to Table 2-5:* Assumed Special Status Species Program Assignments by Agency and Region for Alternative 2 *Because of New Information.*

Strikeouts show changes. Only species with changes are displayed.

TAXA GROUP *Species*	Special Status Species Programs			
	BLM OR/WA[1]	BLM CA	FS R-6	FS R-5
FUNGI				
Chroogomphus loculatus	~~SS~~	-	-	-
Gastroboletus vividus	~~SS~~	-	-	-
~~*Gomphus bonarii*~~	~~-~~	~~-~~	SS	~~SS~~
Macowanites mollis	~~SS~~	-	-	-
Martellia fragrans	~~SS~~	-	-	-
Phaeocollybia californica	SS	SS	SS-O	-
BRYOPHYTES				
Marsupella emarginata v. aquatica	~~SS~~	-	-	-
Orthodontium gracile	~~As~~	SS	-	-
Tritomaria quinquedentata	~~SS~~	-	-	-
MOLLUSKS				
Cryptomastix hendersoni	~~SS~~	-	SS	-
Fluminicola seminalis	-	-	~~SS-O~~	SS
Hemphillia burringtoni	~~SS~~	-	SS-W	-
Hemphillia malonei	~~SS~~	-	SS-W	-
Juga (O) n. sp. 2	~~SS~~	-	SS-O	-
Lyogyrus n. sp. 1	~~SS~~	-	SS	-
Lyogyrus n. sp. 2	~~SS~~	-	SS	-
Monadenia fidelis minor	~~SS~~	-	SS	-

[1]BLM OR/WA list is inclusive of any Oregon Natural Heritage Program List 1 or List 2 species. For effects analysis and disclosure, Bureau Tracking species are not included because site management or pre-project clearances are not required. No lands are managed in the BLM in Washington under the Northwest Forest Plan, therefore, Survey and Manage species that are on the Special Status Species Program on BLM WA may or may not be listed in table 2-5.

As=Bureau Assessment SS=Bureau Sensitive or Forest Service Sensitive
SS-O=FS Sensitive in Oregon SS-W=FS Sensitive in Washington
Hyphens (-) indicate not included, may result from species not occurring in the state.

Potential Mitigation

Species with Insufficient Habitat Caused by Management under Alternative 2

(Near the bottom of page 59, below the paragraph beginning with "Table 2-6 below..." insert:)

Table 2-6S displays changes to Table 2-6 because of new information. There are now 51 species with insufficient habitat (including known sites) to support stable populations in all of their range, and 10 species in part of their range, under Alternative 2 but not under Alternative 1.

Species outcomes for the scenario of Alternative 2 without assignment to one or more of the Agencies' Special Status Species Programs are displayed on Table 3&4-9.1S. Under this scenario, there are an additional 37 species with insufficient habitat (including known sites) to support stable populations in all of their range, and an additional 7 species in part of their range (when compared to Alternative 2 described above). These adverse effects could be mitigated by the application of manage known sites and, for Survey and Manage

Categories A and C species, pre-project clearances, in the species range within the Agency and region/state the Special Status Species Program assignment is not made or is removed.

Species with Insufficient Habitat under all Alternatives or with Insufficient Information to Determine an Outcome

(At the end of this section on page 62, insert:)

Table 2-7S displays changes to Table 2-7 because of new information.

If species are not assigned to or are removed from the Agencies' Special Status Species Programs as assumed (see Table 2-5 and 2-5S), outcomes will not change but additional risk might be incurred. Mitigation for that additional risk is the same as that displayed on Table 2-7 and 2-7S. That is, apply manage known sites and, for Survey and Manage Categories A and C species, pre-disturbance surveys, in the species range within the Agency and region/state the Special Status Species Program assignment is not made or is removed.

(At the end of Table 2-6 on page 61, insert:)

Table 2-6S. ***Changes[2] to Table 2-6:*** **Mitigation Identified to Eliminate Adverse Effects of Alternative 2** ***Because of New Information***

SPECIES	FS WA		FS OR		BLM OR		FS CA		BLM CA	
	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance
BRYOPHYTE										
Marsupella emarginata v. *aquatica*	M	-	M	-	-	-	-	-	-	-
VERTEBRATES										
Great Gray Owl[1]	SSSP		M	M	-	-	SSSP		-	-
Oregon Red Tree Vole (*Northern Mesic Northern Cascades and Xeric Zones*)[1]	-	-	M	M	M		-	-	-	-
Larch Mountain salamander[1]	SSSP	M	SSSP	M	SSSP	M			-	-
Shasta salamander[1]	-	-	-	-	-	-	SSSP	M	SSSP	M
Siskiyou Mountains salamander[1]	-	-	SSSP	M	SSSP	M	SSSP	M	-	-
Van Dyke's salamander[1]	SSSP	M	-	-	-	-	-	-	-	-
~~**MOLLUSKS**~~										
~~*Helminthoglypta talmadgei*[1]~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~M~~	~~--~~	~~SSSP~~	

M = Mitigation identified to eliminate adverse effects in all or part of a species range. Mitigation would apply to Northwest Forest Plan administrative units where habitat is suspected.
SSSP = Assumed to be included in the Special Status Species Programs; site management and pre-project clearances would be conducted in accord with those programs. No mitigation needed.
- = Mitigation not needed because not within species range, not included in Survey and Manage mitigation measure, or species has sufficient habitat in this geographic area.
[1] For these species, there is insufficient habitat only in a portion of the species' range.
[2] Species are not included in this table for changes in Special Status Species Program placement if the reason for the change is that the species did not occur in that administrative unit.

(At the end of Table 2-7 on page 66, insert:)

Table 2-7S. *Changes[3] to Table 2-7*: Species with insufficient information to determine an outcome or having insufficient habitat under both Alternatives 1 and 2; identified mitigation would reduce the (adverse) effects under Alternative 2 to Alternative 1 levels[1] *because of new information*

Species Removed From Table 2-7		
FUNGI	**FUNGI**	**FUNGI**
Boletus pulcherrimus	*Gelatinodiscus flavidus*	*Rickenella swartzii*
Clavulina castanopes v. lignicola	*Hygrophorus karstenii*	*Tylopilus porphyrosporus*
Collybia racemosa	*Mycena tenax*	**LICHENS**
Cortinarius olympianus	*Neolentinus kauffmanii*	*Chaenotheca chrysocephala*
Galerina cerina	*Phellodon atratus*	*Chaenotheca ferruginea*
Gastroboletus rubber	*Ramaria abietina*	**BRYOPHYTES**
Gastroboletus turbinatus	*Ramaria conjunctipes var. sparsiramosa*	*Racomitrium aquaticum*

Species Added to Table 2-7									
SPECIES	**S&M Cat.**	**BLM OR/WA[2]**	**BLM CA**	**FS R6**	**FS R5**	**Insufficient Information to Determine Outcome**	**Insufficient Habitat Not Caused by Fed. Action**	**Manage Known Sites**	**Pre-Project Clearance**
FUNGI									
Galerina sphagnicola	E	~	~	~	~		✓	M	
Ramaria lorithamnus	B	~	~	~	~		✓	M	
Russula mustelina	B	~	~	~	~		✓	M	
Tricholoma venenatum	B	~	~	~	~		✓	M	
LICHENS									
Pannaria rubiginosa	E	As	SS	SS	~		✓	M	M
MOLLUSKS									
Hemphillia pantherina	B	~	~	SS-W	~	✓		M	M

[1] Mitigation would apply to any administrative unit where the species was not recommended for addition to the Special Status Species Programs, and habitat is known or suspected to occur there.
[2] Tracking is a category included in the BLM OR/WA Special Status Species Program. Tracking species are not listed here because the Tracking category requires no site management nor clearance surveys.
[3] Species are not included in this table for changes in Special Status Species Program placement if the reason for the change is that the species did not occur in that administrative unit.

S&M = Survey and Manage
As = Bureau Assessment
SS = BLM or Forest Service Sensitive
SS-W = FS Sensitive in Washington
M = Mitigation to reduce the potential risk of Alternative 2 to Alternative 1 levels.

Alternative 3 (Northwest Forest Plan with Modified Survey and Manage)

(At the end of the third paragraph on page 67, insert:)

For analysis purposes, this assumption is considered in the environmental consequences discussions in Chapter 3&4. However, the effects of not adding species to these programs, or of removing them, are also discussed.

In 2004, the Agencies added species to their respective Special Status Species Programs as assumed in the analysis and displayed on Table 2-10, except as described below and displayed on Table 2-10S.

For BLM OR/WA, changes from 2004 FSEIS to final Special Status Species Programs lists were made to the following species:

- *Hemphillia malonei* (mollusk) - due to ONHP program changing ranking from List 1 to List 4 which moved it from Bureau Sensitive to Bureau Tracking, Bureau Tracking species not identified in this table

(At the end of Table 2-10 on page 81, insert:)

Table 2-10S. ***Changes to Table 2-10:*** **Assumed Special Status Species Program Assignments by Agency and Region[1] for Alternative 3** ***Because of New Information.***

TAXA GROUP *Species*		S&M Cate-gory	Special Status Species Programs BLM OR/WA	BLM CA	FS R-6	FS R-5
MOLLUSKS						
Hemphillia malonei		-	~~SS~~	-	SS-W	-

SS=Bureau Sensitive or Forest Service Sensitive
SS-W= FS Sensitive in Washington
Hyphens (-) indicate not included, may result from species not occurring in the state.

Potential Mitigation

Species with Insufficient Habitat Caused by Management under Alternative 3

(After the second paragraph on page 82, insert:)

Table 2-11S displays changes to Table 2-11 because of new information. Four species are added (for a portion of their range), and one is removed.

Species outcomes for the scenario of Alternative 3 without assignment to one or more of the Agencies' Special Status Species Programs are displayed on Table 3&4-9.1S. Under this scenario, there are an additional two species with insufficient habitat (including known sites) to support stable populations in all of their range (when compared to Alternative 3 described above). These adverse effects could be mitigated by the application of manage known sites and, for Survey and Manage Categories A and C species, pre-project clearances, in the species range within the Agency and region/state the Special Status Species Program assignment is not made or is removed.

Species with Insufficient Habitat under all Alternatives or with Insufficient Information to Determine an Outcome

(At the end of this section on page 84, insert:)

Table 2-12 is removed because new information resulted in the only species on this table moving to a different outcome.

(At the end of Table 2-11 on page 83, insert:)

Table 2-11S. ***Changes to Table 2-11*****: Mitigation Identified to Eliminate Adverse Effects of Alternative 3** ***Because of New Information***

SPECIES	FS WA		FS OR		BLM OR		FS CA		BLM CA	
	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance	Manage Sites	Pre-Project Clearance
VERTEBRATES										
Larch Mountain salamander[1]		M		M		M				
Shasta salamander[1]								M		M
Siskiyou Mountains salamander[1]				M		M		M		
Van Dyke's salamander[1]		M								
~~**MOLLUSKS**~~										
~~*Helminthoglypta talmadgei*[1]~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~M~~	~~-~~	~~SSSP~~	

M = Mitigation identified to eliminate adverse effects in all or part of a species range. Mitigation would apply to Northwest Forest Plan administrative units where habitat is suspected.
SSSP = Assumed to be included in the Special Status Species Programs; site management and pre-project clearances would be conducted in accord with those programs. Manage sites and pre-project clearance mitigation needed.
- = Mitigation not needed because not within species range, not included in Survey and Manage mitigation measure, or species has sufficient habitat in this geographic area.
[1] For these species, there is insufficient habitat only in a portion of the species' range.

Comparison of Alternatives

(Starting on page 93, replace Table 2-14 with Table 2-14S. At the end of Table 2-14S, insert Table 2-14.1S:)

Table 2-14S. Summary of Environmental Consequences.

		Alternative 1	Alternative 2	Alternative 2 with Mitigation	Alternative 3	Alternative 3 with Mitigation
Species and Groups	Insufficient habitat not due to federal actions [1]	131([2])	131([2])	131([2])	131([2])	131([2])
	Insufficient habitat due to actions under the alternative	0	51([2])	0	8([2])	0
	Sufficient Habitat	146	95	146	138	146
	Insufficient Information to Determine Outcome	18	18	18	18	18
Effect on Annual Timber Harvest (MMBF)		-105	-35	-35	-45	-50
Short-term Annual Cost (millions)		$27	$10.5	$11.1	$12.4	$12.5
Long-term (10 years) Annual Cost (millions)		$17.6	$10	$10.4	$10.8	$10.9
Employment Decrease From Full Harvest Level (per Northwest Forest Plan)		-953	-318	-336	-409	-445
Survey Related Employment		+557	+216	+226	+256	+258
Net Loss in Annual Personal Earnings (millions)		-$18.3	-$5.4	-$5.8	-$7.5	-$8.6
Hazardous Fuel Treatment (Annual Acres)		146,060	156,858	156,658	154,900	154,600
Hazardous Fuel Treatment (Cost to Protect Species/Acre)		$84.18	$34.10	$37.10	$23.78	$24

[1] Factors resulting in insufficient habitat are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, or narrow ecological amplitude.

[2] Species with sufficient habitat range-wide, but with insufficient habitat in a portion of the range. These are included in the "sufficient habitat" count.

Table 2-14.1S. *(New Table)* Summary of Environmental Consequences for the 145 Species Assumed to be on Special Status Species Programs.

		Alternative 1	Alternative 2		Alternative 3	
			With SSSP	Without SSSP	With SSSP	Without SSSP
Species and Groups	Insufficient habitat not due to federal actions [1]	36(1[2])	36(1[2])	36(1[2])	36(1[2])	36(1[2])
	Insufficient habitat due to actions under the alternative	0	36(10[2])	73(13[2])	6(6[2])	8(5[2])
	Sufficient Habitat	100	64	27	94	92
	Insufficient Information to Determine Outcome	9	9	9	9	9

[1] Factors resulting in insufficient habitat are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, or narrow ecological amplitude.
[2] Species with sufficient habitat range-wide, but with insufficient habitat in a portion of the range. These are included in the "sufficient habitat" count.

(At the end of Table 2-15 on page 103, insert:)

Table 2-15S. ***Changes to Table 2-15*****: Summary of Environmental Consequences for all 295 Survey and Manage Species and 4 Arthropod Functional Groups** ***Because of New Information.***

This table summarizes, by alternative, the outcome, management, and identified mitigation that would change an outcome for each Survey and Manage species.	**Alternative 1**		**Alternative 2**					**Alternative 3**					
	Outcome	Survey & Manage Category	Outcome	BLM OR/ WA[1]	BLM CA	FS R-6	FS R-5	Outcome	Survey & Manage Category	BLM OR/ WA[1]	BLM CA	FS R-6	FS R-5
BRYOPHYTE													
Marsupella emarginata v. aquatica	1	B	**3**			**MK**		1	B				
Orthodontium gracile	1	B	1	~~**As**~~	SS			1	B				
Racomitrium aquaticum	**1**	E	**1**					**1**	E				
Tritomaria quinquedentata	4	B	4	~~**SS**~~				4	B				
FUNGI													
Boletus pulcherrimus	**1**	B	**1**	SS		SS	SS	**1**	B				
Chroogomphus loculatus	3	B	3	~~**SS**~~				3	B				
Clavulina castanopes v. lignicola	**1**	B	**1**		SS			**1**	B				
Collybia racemosa	**1**	B	**1**		SS		SS	**1**	B				
Cortinarius olympianus	**1**	B	**1**					**1**	B				
Galerina cerina	**1**	B	**1**					**1**	B				
Galerina sphagnicola	**3**	E	**3**					**3**	E				
Gastroboletus ruber	**1**	B	**1**					**1**	B				
Gastroboletus turbinatus	**1**	B	**1**					**1**	B				
Gastroboletus vividus	3	B	3	~~**SS**~~				3	B				
Gelatinodiscus flavidus	**1**	B	**1**					**1**	B				
~~*Gomphus bonarii*~~	~~**1**~~	~~**B**~~	~~**3**~~			~~**SS**~~		~~**1**~~	~~**B**~~				
Hygrophorus karstenii	**1**	B	**1**					**1**	B				
Macowanites mollis	3	B	3	~~**SS**~~				3	B				
Martellia fragrans	3	B	3	~~**SS**~~				3	B				
Mycena tenax	**1**	B	**1**					**1**	B				
Neolentinus kauffmanii	**1**	B	**1**					**1**	B				
Phellodon atratus	**1**	B	**1**					**1**	B				
Ramaria abietina	**1**	B	**1**					**1**	B				
Ramaria conjunctipes var. sparsiramosa	**1**	B	**1**					**1**	B				
Ramaria lorithamnus	**3**	B	**3**					**3**	B				
Rickenella swartzii	**1**	B	**1**					**1**	B				
Russula mustelina	**3**	B	**3**					**3**	B				
Tricholoma venenatum	**3**	B	**3**					**3**	B				
Tylopilus porphyrosporus	**1**	D	**1**					**1**					

Table 2-15S. *Changes to Table 2-15*: Summary of Environmental Consequences for all 295 Survey and Manage Species and 4 Arthropod Functional Groups *Because of New Information*.

This table summarizes, by alternative, the outcome, management, and identified mitigation that would change an outcome for each Survey and Manage species.	Alternative 1		Alternative 2					Alternative 3					
	Outcome	Survey & Manage Category	Outcome	BLM OR/ WA[1]	BLM CA	FS R-6	FS R-5	Outcome	Survey & Manage Category	BLM OR/ WA[1]	BLM CA	FS R-6	FS R-5
LICHENS													
Chaenotheca chrysocephala	**1**	B	**1**					**1**	B				
Chaenotheca ferruginea	**1**	B	**1**					**1**	B				
Pannaria rubiginosa	**3**	E	**3**					**3**	E				
Peltigera pacifica	1	E	**1**					1	E				
MOLLUSKS													
Cryptomastix hendersoni	1	A	1	~~SS~~		SS		1	A				
Fluminicola seminalis	1	A	2	~~SS~~			SS	1	A				
Helminthoglypta talmadgei	**1**	D	**1**		SS		~~MK~~	**1**			SS		
Hemphillia burringtoni	1	E	1	~~SS~~		SS-W		1	E				
Hemphillia malonei	1	C	1	~~SS~~		SS-W		1				~~SS-W~~	
Hemphillia pantherina	~~4~~	B	~~4~~					~~4~~	B				
Juga (O) n. sp. 2	1	A	1	~~SS~~		SS-O		1	A				
Lyogyrus n. sp. 1	1	A	1	~~SS~~	SS	SS		1	A				
Lyogyrus n. sp. 2	1	A	1	~~SS~~		SS		1	A				
Monadenia fidelis minor	1	A	1	~~SS~~		SS		1	A				
VERTEBRATES													
Larch Mountain salamander	1	A	**2**[7]	As **PPC**		SS **PPC**		**2**[7]	A	**PPC**		**PPC**	
Shasta salamander	1	A	**2**[7]		SS **PPC**		SS **PPC**	**2**[7]	A		**PPC**		**PPC**
Siskiyou Mountains salamander, North Range	1	D	**2**	SS **PPC**		SS-O **PPC-O**	SS **PPC**	1		SS		SS-O	SS
Siskiyou Mountains salamander, South Range	1	A	**2**[7]	SS **PPC**		SS-O **PPC-O**	SS **PPC**	**2**[7]	A	**PPC**		**PPC-O**	**PPC**
Van Dyke's salamander	1	A	**2**[7]			SS **PPC**		**2**[7]	A			**PPC**	
Great Gray Owl	1	A	**2**			**SS-W MK-O PPC-O**	SS	1	A				
Oregon Red Tree Vole	2	C	2	SS[6] **MK PPC**		SS[6] **MK PPC**		2		SS[6] **MK PPC**		SS[6] **MK PPC**	

[1]No lands are managed by the BLM in Washington under the Northwest Forest Plan

[6]Species recommended for inclusion in Special Status Species Programs in the northwestern Oregon coast area only (north of Highway 20, west of the Willamette Valley).

[7]Not surveying in stands that have not yet reached late-successional and old-growth condition could cause inadvertent loss of sites and reduce the habitat necessary to support stable populations.

Bold Text in table represents changes to 2004 FSEIS.

Outcomes:
1 = Habitat sufficient to support stable populations in NWFP area
2 = Habitat sufficient to support stable populations in NWFP area except in a portion the area
3 = Habitat insufficient to support stable populations in NWFP area
4 = Insufficient information to determine an outcome
For more detail see Chapter 3&4.

Survey and Manage Categories:
A = Rare, pre-disturbance surveys practical, manage all known sites
B = Rare, pre-disturbance surveys not practical, manage all known sites
E = Rare, status undetermined, manage all known sites
C = Uncommon, pre-disturbance surveys practical, manage high priority sites
F = Uncommon, status unknown
D = Uncommon, pre-disturbance surveys not practical or not required, manage high priority sites
These categories are described in detail in Table 2-2 and Appendix 1 for Alternative 1 and Table 2-9 and Appendix 4 for Alternative 3.

Special Status Species Categories:
SS=BLM Sensitive or FS Sensitive
As =BLM OR Assessment
-O= Oregon only
-W= Washington only
For more detail see Alternative 2 description in Chapter 2.

Mitigation:
MK = Mitigation manage known sites
PPC = Mitigation pre-project clearances
For more detail see Potential Mitigation discussion under Alternative 2 and Alternative discussion in Chapter 2.

Chapter 3 & 4

Chapter 3 & 4 – Affected Environment and Environmental Consequences

Introduction

Unless otherwise changed or supplemented by information presented in this Draft Supplement (other than minor edits obviously changed by the new information), information in the 2004 FSEIS continues to apply.

This Chapter contains additional information and analysis about affected environments and environmental consequences in response to the deficiencies identified by the Court, and in response to new information learned since completion of the 2004 analysis. Specifically the Chapter contains a rewritten *Wildland and Prescribed Fire* section and related text and table revisions for the *Costs of Management* and *Socioeconomics Effects* sections; a new *Survey and Manage Species* and *Late-Successional Forest Ecosystems* section; additional text for all Survey and Manage species to address new information since 2004; and, species effects for the scenario of Alternatives 2 and 3 without assignment of species to Agencies' Special Status Species Programs. New or revised tables and figures are included, as well as brief tables simply showing changes to existing tables. A new Table 3&4-8 near the end of this chapter shows new species known site numbers, as well as detections from the recently completed Random Multi-Species (RMS) Survey portion of Strategic Surveys. Additional explanatory paragraphs are also included.

Relationship of this SEIS to the Northwest Forest Plan Final SEIS and the 2000 Survey and Manage Final SEIS

(At the end of this section on page 108, insert :)

The 2000 Final SEIS was limited to correcting Survey and Manage implementation difficulties. The resultant decision clarified required management, removed unnecessary and duplicative or conflicting requirements, added a process for changing species between categories, and added a process for adding or removing species from Survey and Manage based on new information. The 2000 Final SEIS did not re-examine whether Survey and Manage was needed to meet the requirements of the 1982 NFMA, FLPMA, or the O&C Act. The 2000 Final SEIS simply indicated there was not enough experience with the provision itself to justify an alternative specifying its removal at that time.

To provide sideboards for the alternatives, the 2000 Final SEIS introduced the term "persistence objective" as *"providing for roughly the same likelihood of persistence as that which was provided by the Northwest Forest Plan as originally adopted in the 1994 ROD"* (USDA, USDI 2000a:42). The 2000 FSEIS did not establish or define a legal requirement with respect to persistence. It simply referenced the level of protection provided by the Plan.

Similarly, the 2000 Final SEIS did not define or attempt to rebalance the objectives of the Plan. Those objectives remain as President Clinton established them: "The need to protect long term health of our forests, our wildlife and our waterways…" and … "produce a predictable and sustainable level of timber sales and non timber resources that will not degrade or destroy the environment." (USDA, USDI 1994a:1-4; USDA, USDI 1994b:3). Survey and Manage was not a foundational objective of the Plan. Rather, Survey and Manage was a mitigation measure adopted to help "avoid, rectify, reduce, or eliminate potentially adverse environmental impacts of forest management activities" expected under the basic elements of the Northwest Forest Plan. (USDA, USDI 1994b:29). As noted on page 10 of the 2000 FSEIS, the evidence and experience in 2000 did not suggest a need

for fundamental restructuring of Survey and Manage Standards and Guidelines at that time, nor did it suggest alternatives to satisfy the Plan's foundational objectives. The purposes of the 2000 FSEIS, and the resulting decisions, were therefore quite different from those of the 2004 FSEIS.

In discussing the origin of the Survey and Manage Standards and Guidelines, the 2000 FSEIS noted that "Survey and Manage and other mitigation measures were designed to provide additional benefits to species while maintaining the balance between late-successional and old-growth forest habitat and forest products" (USDA, USDI 2000a:8). Of the alternatives examined in 1994, the selected alternative "was deemed to provide the most appropriate level of management for late-successional and old-growth forest related species while providing a sustainable and predictable level of timber harvest and other forest uses. The benefits or detriments of the adopted mitigation measures on environmental, economic, and social consequences were anticipated to have "relatively minor" changes on expected effects of the alternatives." (USDA, USDI 1994a:3&4-39; USDA, USDI 2000a:8). The 2004 FSEIS notes that in 1994, Survey and Manage was predicted to decrease Probable Sale Quantity (PSQ) by 6 million board feet annually (MMBF) and "add to the uncertainty of the PSQ calculations"; in the 2000 FSEIS the PSQ decrease was estimated at 51 MMBF, and by 2004 was estimated at 105 MMBF (2004 FSEIS:6,226). That this effect no longer maintained the balance, and no longer resulted in relatively minor changes on expected effects, were presented as part of the frustration of the 2004 "Need" for healthy forest ecosystems and a sustainable supply of timber and other forest products (2004 FSEIS:5,6).

The system of Late-Successional and other Reserves provide the Plan's primary management for late-successional and old-growth forest associated species (USDA, USDI 2000a:26). The mitigation of Survey and Manage was established for species whose persistence was uncertain to be provided by the reserves and other elements of the Northwest Forest Plan. The FEMAT had originally expressed concern about these species because "it is widely accepted that the vascular plants, fungi, and lichens, along with the invertebrates, are critically important for the maintenance of ecosystem function and productivity" (USDA et al. 1993:II-34). The Agencies' Northwest Forest Plan monitoring report *Status and Trend of Late-Successional and Old-Growth Forest*, however, has found older forest abundance, diversity, and connectivity to be within the range of natural variability, except perhaps, for the provinces of the eastern Cascades, a condition the FEMAT predicted as 77 percent likely in 100 years (Moeur et al. 2005). This finding is discussed in more detail in the *Late-Successional Forest Ecosystems* section later in this Supplement.

The FEMAT did not add Survey and Manage. The senior FEMAT scientists took the view that there was sufficient late-successional and old-growth forest in reserves to protect these species, and that further protections should await evidence of risk (Thomas et al. 2006). These scientists recommend that management:

> *"Focus species-specific protection on endangered, threatened, and at-risk species. Management plans can cope with only a limited number of individual species if they are to be effective. Franklin (1993), for example, argues that "larger-scale approaches – at the level of ecosystems and landscapes – are the only way to conserve the overwhelming mass – the millions of species- of existing biodiversity." Thus, we generally advocate a coarse-filter approach in which we rely on ecosystem diversity to provide for maintenance of species diversity. We recognize, however, that addition species-level criteria will often be needed. Clearly a fine-filter approach is required for federally threatened and endangered species. It is also prudent to recognize species whose habitat, without special consideration, might deteriorate sufficiently so as to require listing under our Endangered Species Act. The new USFS planning rules and directives provide an example of this approach … They call for forest plans to provide for appropriate ecological conditions for threatened and endangered species and species of concern, with "species of concern" being those species that might require listing as threatened without special action. Furthermore the directives suggest use*

> *of lists from credible independent sources ("NatureServe") in making that determination" (Thomas et al. 2006).*

This is precisely what the proposed action suggests.

Survey and Manage was adopted to address concerns due to a lack of information, apparently small and endemic populations associated with scarce habitats, and adverse impacts from previous management (USDA, USDI 2000a:26). The Agencies have more then twice the years of experience implementing the Survey and Manage standard than when the 2000 FSEIS was written. Survey Protocol and Management Recommendation documents are in use for most species, tens of thousands of sites have been discovered, and the field work for over 700 random multi-species survey sites and other strategic surveys are completed and being analyzed. When completed, this last item will essentially complete surveys intended by the original Survey and Manage Categories 3 and 4. This and other information about Survey and Manage species is discussed in the *Survey and Manage Species* section later in this Supplement.

Incomplete or Unavailable Information

(At the end of this section on page 109, insert :)

This analysis indicates there are 18 species with insufficient information to determine an outcome, and 131 species (and one in part of its range) with insufficient habitat to support stable populations under all alternatives. The risk that one or more of these species could be extirpated from the NWFP area is unknown. The cost of obtaining additional information about these species is prohibitive; they have been included in the Survey and Manage program for over 10 years in large part because little is known about them. The effect of such a loss to ecosystem function is also unknown and is likely immeasurably small. These risks and implications are discussed in the new *Survey and Manage Species* and *Late-Successional Forest Ecosystem* sections in this Supplement. For an additional 61 species, effects writers predict they would have insufficient habitat to support stable populations in all or part of their range under Alternative 2, and 14 species receive this outcome prediction under Alternative 3. As discussed in *the Survey and Manage Species* section, the outcome is based on the species' reference distribution and appears highly unlikely to be a prediction of extirpation from the NWFP area. These species, and the implications of risk, are also discussed in the new *Survey and Manage Species and Late-Successional Forest Ecosystem* sections in this Supplement.

Assumptions and Information Common to All Alternatives

(At the end of the discussion of Reserves on page 109, insert:)

Because of ingrowth, and the Reserves being larger than estimated in the 1994 Record of Decision, late-successional forest in Reserves now totals approximately 7.9 million acres. For additional detail, see discussion in the *Late-Successional Forest Ecosystem* section in this Supplement.

New Information

(After the first full paragraph on page 113, insert:)

A data call for new Survey and Manage species site information was sent to Agencies' administrative units on March 8, 2006, and resultant new data was used to update Agencies' databases, which in turn were used to compile data for this analysis. The numbers of sites known for each species, as well as new sites reported since the data cutoff

date for the 2004 FSEIS, are shown in Table 3&4-8S at the end of this Chapter. New site data, new research, and other publications, as well as new information about threats and other activities, have been considered and used to update effects to individual species discussed later in this Supplement. Several species outcomes have changed. These are shown on Table 3&4-9S, and these changes are reflected in various outcome summaries and other tables.

Cumulative Impacts

(After the last paragraph on page 115 (extending onto page 116), insert:)

The BLM has begun the process of revising its Land and Resource Management Plans within the NWFP area in compliance with the aforementioned Settlement Agreement. Alternatives being considered could substitute current Northern Spotted Owl and Marbled Murrelet Critical Habitat for Late Successional Reserves, or manage the entire landscape using a long rotation to provide habitat for Northern Spotted Owls and Marbled Murrelets. In addition, alternatives could remove the application of the BLM OR/WA Special Status Species Policy dealing with Bureau Sensitive, Tracking, and Assessment species from O&C land. While the Settlement Agreement requires the BLM to consider an alternative that would eliminate reserve allocations except as required to avoid jeopardy under the Endangered Species Act and be consistent with the O&C Act as interpreted by the 9th Circuit Court of Appeals, it would be premature to assume which alternative will be selected, and thus how it might affect Survey and Manage species. The laws affecting species on O&C Lands Act lands are quite different from those affecting the National Forests under the 1982 planning regulations. The BLM plan revision process will analyze effects of alternatives once they are clearly identified. As noted in the 2004 FSEIS, the BLM will continue to manage lands under its administration in accordance with existing resource management plans until the plan revisions are completed.

Background for Effects Analysis

Comparison of Alternatives for this SEIS

(After the last full paragraph on page 119, insert:)

However, because the addition of specific species to these programs is discretionary on the part of Forest Service Regional Foresters and BLM State Directors, the effects of not adding species to these programs, or of removing them at this time, are also described.

(On page 124, before the Summary of Environmental Consequences for Species section, insert:)

Species Site Information Sources

The species site numbers displayed on Table 3&4-8S serve as one of the key sources of information upon which species outcomes, and other analysis within this Supplement, are based. Known species sites are recorded in the Agencies' databases when there is credible information as to species and specific location. This information can come from a variety of sources including private and public herbaria and other collections, publications, agency and other surveys conducted for purposes other than Survey and Manage (e.g. lichen air quality survey), and other sources. As noted in the *Survey and Manage Species* section in this Supplement, compilation of data from these sources served as the beginning of the Survey and Manage database. Site data also comes from the Agencies own surveys conducted under Survey and Manage. For example, more than half of the Agencies 68,000 site records of current and former Survey and Manage species come from pre-disturbance Survey and Manage surveys.

Types of Survey and Manage Surveys

There two main categories of surveys conducted for Survey and Manage species, *pre-disturbance surveys* and *strategic surveys.* Pre-disturbance and many types of strategic surveys are non-random, so the ability to make inferences about occupancy in similar habitat away from the survey area can be limited. Because of this, sometimes dozens to hundreds of detections from biased surveys may not provide enough information to say with any certainty the species will be stable and well distributed in the NWFP area. Random strategic surveys can be used to make statistically-based inferences about sample populations and habitat, but data from such surveys have only recently become available and statistical evaluation is still under way.

Since individual species discussions later in this chapter reference, and necessarily rely on, site numbers obtained from all of these sources, it is important to understand the nature and objective of each of the types of surveys used.

Pre-disturbance Surveys

Pre-disturbance surveys are clearance surveys that focus on a project unit with the objective of reducing the inadvertent loss of undiscovered sites by searching specified potential habitats prior to making decisions about habitat-disturbing activities. They are done according to a written survey protocol for each species and can use methods such as transects or plots that focus on priority habitats, habitat features, or involve the entire project area (USDA, USDI 2001a:Attachment 1:21). Pre-disturbance surveys are required for most Survey and Manage species if such surveys are "practical." Pre-disturbance surveys are deemed practical for species whose physiological characteristics make them likely to be located with reasonable effort. (Some species are too small to be detected, don't show themselves regularly and predictably, or can't be separated from other species outside of a lab.) Surveys for some species must be conducted during a relatively narrow timing window when they are in bloom or otherwise annually (or no less than semi-annually) showing definitive characteristics. Pre-disturbance surveys are required prior to habitat-disturbing activities for 63 species currently on Survey and Manage. The majority of Survey and Manage species known sites have been located with these surveys.

Strategic Surveys

Strategic surveys gather information at different scales about the species' range, distribution, and habitat requirements. Strategic survey efforts have varied from broad-scale, multiple species surveys to more small-scale surveys depending on the information needs. These surveys and methods include probability-sampling approaches; proposive surveys in likely habitat (if known); known site surveys to collect habitat information; modeling of potential habitat; and for some species, specific surveys and other information-gathering techniques were used to answer specific information needs. Existing pre-disturbance survey experience is used to help design strategic surveys, in part because pre-disturbance surveys were conducted before strategic surveys. Both positive and negative detection information helps indicate the most appropriate strategic survey approach.

<u>Probability-Sampling Approaches</u>:

Probability-based approaches allow for inference to the broader sampled landscape (Molina et al. 2003). The random selection of sample plots reduces bias and includes measures of uncertainty, including standard errors and confidence intervals. It is also a method of formal testing statistical hypotheses. Probabilistic sampling has been conducted at different spatial scales for various Survey and Manage species groups and individual species including amphibians, red tree vole, mollusks, lichens, bryophytes, and fungi.

The Random Multi-Species (RMS) Survey is an example of a statistically-based probability-sampling survey. It used a double sample design of random and systematic sampling that allows unbiased detection estimates and species associations with reserve land allocations and late-successional forest. The Agencies completed the field survey portion of the RMS Surveys in Autumn 2004, using a stratified sample of Continuous Vegetation Surveys (CVS) and Forest Inventory and Analysis (FIA) plots. The percentages of plots by strata were as follows:

60% Reserve and late-successional/old-growth
20% Reserve and non-late-successional/old-growth
10% Matrix and late-successional/old-growth
10% Matrix and non-late-successional/old-growth

The survey sampled 750 botany plots, 658 fungi plots, and 509 mollusk plots (mollusks were only sampled in Oregon and Washington). Analysis of the results is complex and necessarily species and taxa-specific. That analysis is under way now. In the absence of the complete analysis, raw detections from the RMS Survey are displayed separately on Table 3&4-8S. Guidelines are provided below for drawing minimum inferences from such sites.

Detections in the statistical sample are used to estimate detections across the sample area. For the RMS Survey, the population was stratified so that detection in one stratum does not necessarily represent the same area as detection in another stratum. For example, each sample plot represents anywhere from 7,000 to over 200,000 similar areas (i.e., plots of the same size), depending upon the species and strata. Since there is uncertainty (standard error) associated with sampling, a 95% confidence bound is determined. For example, for a lichen species with RMS Survey detections, for one or two detections, the 95% confidence bound includes zero. For three detections, the 95% confidence bound is 4,381 0.2-ha plots. The 95% confidence bound for at least three detections is 23,612 0.1-ha plots for epigeous fungi, 236,102 0.01-ha plots for hypogeous fungi, and 2,361 0.1-ha plots for mollusks. However, in the absence of completed analysis, questions remain regarding what those numbers represent in terms of species aggregation, locations, or relative rarity.

Proposive Surveys:

The proposive survey is a knowledge-based approach that relies on the ability of experts to recognize and concentrate survey effort in potentially occupied or suitable habitats. The objective of these surveys was to locate additional sites in high likely habitats or attempt to relocate known sites of species that have not been observed for several years. They are used primarily for species known from none or few sites to help confirm presence.

Known Site Surveys:

Known site surveys (surveying known locations of Survey and Manage species to relocate the site and collect habitat information) have been conducted for selected species at hundreds of known sites. The data collected from these surveys provides information about habitat, provides specific location data, and can be used to develop potential habitat maps for species modeling. In association with these surveys, habitat modeling using potential natural vegetation is ongoing for selected Survey and Manage species.

Habitat Modeling:

Modeling of Survey and Manage species habitat has occurred at various scales. Large-scale habitat modeling using Potential Natural Vegetation and Plant Associations has been done for several species in all taxonomic groups. These models use data collected from known site surveys to develop maps showing high-, moderate, and low- likely habitats and can be used to identify areas where proposive surveys can be conducted. These maps are then calibrated and validated through ground-truthing surveys. Once these models are

validated, they can estimate the amount of potential habitat there is for that species. Micro-site habitat modeling using the Bayesian Belief Model identifies the likelihood a species is present at a specific location. A similar modeling effort has been conducted for red tree vole habitat. These site-specific models potentially can be used to determine if pre-disturbance surveys are necessary. Additional habitat modeling has been conducted for three salamander species.

Species Specific Surveys and Other Information-Gathering Techniques:

Other strategic surveys were conducted that focused on answering specific information needs. These varied efforts included species-specific surveys, research designed to address specific questions such as habitat associations, genetic and taxonomic analyses, and historic data compilation, Examples include arthropod literature synthesis, radio telemetry work on red tree vole to answer connectivity concerns and seasonal movements, determination of mollusk clades, and determining habitat associations at multiple scales for an amphibian species.

Key Assumption for Environmental Consequences for Species on Survey and Manage and Agencies' Special Status Species Programs Simultaneously

Approximately half of the species discussed in this Supplement are on one or more of the Agencies Special Status Species Programs at this time. With the reinstatement of the Survey and Manage Standards and Guidelines in January 2006 by the District Court, these species are now covered by both programs. Because the Survey and Manage provisions provide protection that are similar to those provided by the Special Status Species Programs, species effects discussions for Alternative 1 (and Alternative 3 for Category A, B, and E species) in this Supplement generally do not mention, or attribute benefits to, inclusion in the Special Status Species Programs. Such attribution would be unnecessarily duplicative.

Summary of Environmental Consequences for Species

(On pages 124-125, replace this entire section with the following:)

Habitat (including known sites) is insufficient to support stable populations in the Northwest Forest Plan area under all alternatives

There are 131 species (115 fungi and 16 lichens) with an outcome of habitat (including known sites) is insufficient to support stable populations range wide in the NWFP area under all alternatives (see Table 3&4-9S). This outcome is not due to federal actions, but other factors such as: (1) limited potential habitat and few populations on federally managed lands; (2) potential for stochastic events; (3) low number of individuals; (4) limited distribution; and, (5) narrow ecological amplitude (USDA, USDI 1994a; USDA, USDI 2000a).

Insufficient information to determine an outcome under all alternatives

There are 18 species (5 bryophytes, 3 fungi, 1 mollusk, and 9 lichens) and 4 arthropod functional groups for which there is insufficient information to determine an outcome under all alternatives (see Table 3&4-9S). This is due to limited information about abundance, distribution, and ecology of these species. In addition, for some of these species, there is uncertainty regarding effects of management practices and environmental conditions including global climate change.

Under Alternative 1, when the analyses shows that there is "insufficient information to determine an outcome" or "insufficient habitat (including known sites) to support stable

populations" for a species, this outcome is the same for Alternatives 2 and 3 as well. Although presumably the Survey and Manage Standards and Guidelines generally provide benefits to species, they do not substantively change the outcomes or resolve the lack of sufficient information. However, many of these are species with few known sites or populations. For species with insufficient habitat under all alternatives that are not included in the Agencies' Special Status Species Programs under Alternatives 2 or 3, the lack of species management may increase the risk to these species. For species where there is "insufficient information to determine an outcome" and they are not included in the Agencies' Special Status Species Programs under Alternatives 2 or 3, it is unknown if the lack of species management would increase the risk to these species.

Habitat (including known sites) is sufficient to support stable populations in the Northwest Forest Plan area under all alternatives

There are 85 species with an outcome of habitat (including known sites) is sufficient to support stable populations in the NWFP area under all alternatives (see Table 3&4-9S).

Habitat (including known sites) is insufficient to support stable populations in the Northwest Forest Plan area under Alternatives 2 and 3

There are 51 and 8 species for which an outcome of habitat (including known sites) is sufficient to support stable populations in the NWFP area under Alternative 1, but habitat (including known sites) is insufficient to support stable populations in the NWFP area under Alternatives 2 and 3, respectively (see Table 3&4-9S).

Habitat is insufficient to support stable populations in a portion of the Northwest Forest Plan area under Alternatives 2 and 3

There are 10 and 6 species for which an outcome of habitat (including known sites) is sufficient to support stable populations in the NWFP area under Alternative 1, but habitat is insufficient to support stable populations in a portion of the NWFP area under Alternatives 2 and 3, respectively (see Table 3&4-9S).

(Near the bottom of page 125, just before the Aquatic Ecosystem section, insert:)

Environmental Consequences for Court-Identified Special Status Species Programs Scenarios

The August 1, 2005 District Court decision that lead to creation of this Supplement requires the Agencies to "analyze potential impacts to Survey and Manage species if they are not added to or are removed from the Forest Service's and BLM's respective programs for special status species" (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1197). Therefore, effects discussions for species included in this Supplement provide, for every species assumed in the 2004 FSEIS to be assigned to one or more of the Agencies Special Status Species Programs, outcome statements for Alternatives 2 and 3 without the assumption of Special Status Species Programs assignment. The outcomes are provided to display for the public, the SEIS/ROD decision makers (Secretaries of Agriculture and Interior), and the Special Status Species Programs' administrators (BLM State Directors in California and Oregon, and Forest Service Regional Foresters in Regions 5 and 6) the consequences of not adding individual species to the respective SSSP as shown on Table 2-5 and otherwise assumed in the effects analysis. Display of such effects is required under NEPA, the Court explained, because even though the Agencies have subsequently added the species to their Special Status Species Programs, the 2004 analysis relied on "an assumption based on uncertain future events that there is no guarantee will occur" (Northwest Ecosystem Alliance v. Rey, 380 F. Supp. 2d 1175 (W.D.Wash. 2005) at 1190).

Removal of the Special Status Species Programs (SSSP) assignments are displayed as "scenarios" in the species effects discussions in this Supplement, and may be abbreviated "Alternative 2 without SSSP", "Alternative 2 without assignment to the R-5 Sensitive Species Program," and so forth. The reference means the outcome (effect) is for Alternative 2 as if none of the assumed Special Status Species Program assignments were to occur, or were undone at this time for those species where such assignment has already occurred. Results are summarized on Table 3&4-9.1S.

Late-Successional Forest Ecosystems

Affected Environment

(At the end of this section on page 130, insert:)

New Information about the Late-Successional Forest Ecosystem

The reserves are larger, and contain far more late-successional forest, than described in the Northwest Forest Plan Record of Decision. They also contain far more late-successional forest than when the FEMAT viability panels rated each species. Further, harvest rates of late-successional forests in the Matrix have been less than half of that projected in the Plan.

The Additional Species Analysis (see 2004 FSEIS:16-17) and environmental analysis resulted in the addition of 775,000 acres to the Riparian and Late-Successional Reserves between the 1993 FEMAT report and the 1994 Northwest Forest Plan Record of Decision (USDA, USDI 1994b:29). Approximately 35 percent of this (USDA, USDI 1994a:3&4-41), or 270,000 acres, is late-successional forests.

The FEMAT (and 1994 Northwest Forest Plan Record of Decision) estimated Riparian Reserves to encompass, on average, 40 percent of all NWFP areas (USDA, USDI 1994b:B-12). The FEMAT estimate was based on analysis of sample stream systems appearing on broad scale topographic maps (Johnson et al. 1993). Subsequent Watershed Analyses and project planning experience by the Agencies' administrative units has shown that estimate to be 20 to 30 percent too low west of the cascades where vegetation apparently kept photo-interpreters from mapping all intermittent streams and wet areas. Northwest Forest Plan practitioners generally use at least 50 percent as a more accurate reflection of average area in Riparian Reserves, or an increase of approximately 675,000 acres from within Matrix, and approximately 100,000 acres from within Adaptive Management Areas (AMA). Approximately 29 percent of this (USDA, USDI 1994a:3&4-41), or 225,000 acres, is late-successional forest now in reserves.

Much of this Riparian Reserve increase is reflected in the decrease in PSQ from the original 958 to the present 805 million board feet (MMBF). Six Oregon BLM and four Region 5 Forest Service land management plans were in draft when the Northwest Forest Plan was finalized in 1994. As described in the 2000 FSEIS, completion of those plans in 1995, and subsequent review of six Region 6 Forest Service land management plan PSQs to reflect increased Riparian Reserve estimates and other corrections, resulted in a 15 percent decrease in PSQ and an increase of late-successional forests in reserves of about 200,000 acres (USDA, USDI 2000a:429-430). In addition, managers from the above units and others report actual Riparian Reserve acres to be considerably higher than estimated in the documentation of the FEMAT sampling (Johnson et al. 2003) or their completed management plans.

Actual harvest during the first ten years of the Northwest Forest Plan (contributing to PSQ, including regeneration harvesting in the matrix) has been about 56 percent of PSQ (2004 FSEIS:222; Baker et al. 2005). Reasons for this have included: More Survey and Manage site protection was needed; for some species Endangered Species Act compliance has

resulted in more habitat acres need to be retained in the Matrix; AMA Plan(s) have called for deferral of harvests from the first decade; project and program lawsuits have reduced sale offerings (including the Pacific Coast Federation of Fishermen's Association v. National Marine Fisheries Service, 71 F. Supp.2d 1063, 1069 (W.D. Wash. 1999)); areas are not economical to harvest, often in part because adjacent areas are excluded from harvest by the other factors listed here; and funding and personnel issues have slowed some offerings. Further, the above factors have prevented harvests within late-successional forests disproportionate with the volume reduction. Thus, with approximately 247,000 acres of late-successional forest expected to be harvested in the first decade (2004 FSEIS:111), there is approximately 200,000 acres of late-successional forest more than was projected in 1994.

The ingrowth into late-successional forest within the NWFP area is projected to be approximately 2 ½ times the acres projected to be harvested and lost to fire combined. (2004 FSEIS:110) The result is a net increase in late-successional forest of 540,000 acres per decade (a combination of a 590,000 acre increase in late-successional forest in reserves and a 50,000 acre decrease in Matrix/AMA.) Further, it would be incorrect to characterize this increase as being all young stands. Indeed, a significant acreage grew into the 80 to 90-year age class, but stands already in that age class grew on to the 90 to 100-year age class, and so forth. Thus, all late-successional and old-growth stands became older through time. While the total acres of late-successional forest have increased, the relative proportion in different ages has not significantly changed. And while the continued development of late-successional characteristics in these older stands is dependent upon events and not just age, a general assumption that these acres will become richer in late-successional forest characteristics as they get older, is reasonable. Finally, even in the Matrix/AMA where regeneration harvests is removing older stands, harvests do not simply take the oldest. For a variety of access and other resource-related reasons, regeneration harvest activities occur across all late-successional age classes.

In summary, there were 270,000 additional late-successional forest acres allocated to reserves between the FEMAT report and the Northwest Forest Plan Record of Decision and 225,000 acres more late-successional forests in Riparian Reserves because of underestimating by the FEMAT. In addition, between the 1993 FEMAT analysis and this 2006 Supplement, the late-successional forest in reserves has increased by approximately 750,000 acres due to ingrowth (590,000 net acres per ten years). The total increase in late-successional forests in reserves since the FEMAT analysis (including the viability panels) is thus roughly 1,245,000 acres. This is a 19 percent increase over the 6,623,200 acres of late-successional forests in reserves displayed in the FEMAT report (USDA et al. 1993:IV-54). There is also an estimated 200,000 more late-successional acres than projected by the FEMAT because harvesting levels have been lower than projected.

A ten-year Northwest Forest Plan Monitoring Report, *Status and Trend of Late-Successional and Old-Growth Forest*, was published in 2005. The late-successional forest increases shown in the ten-year report parallel and confirm the increases described above. That is,

> *"The environmental impact statement (USDA, USDI 1994a, USDA, USDI 2000) assumed that 0.7 percent of the Plan area would be lost to stand-replacing wildfire per decade, and that 1 percent of the Plan area (or 3 percent of the total late-successional forest) would be harvested per decade. It further assumed that ingrowth from younger classes into older forest classes would occur at a rate of 3.5 percent per decade on reserve lands, and 0.7 percent per decade on matrix lands. On balance, older forest was expected to increase by 600,000 acres in the first decade, and by 2.7 million acres after 50 years.*
>
> *"Our monitoring results, albeit bases on short-term observed trend, appear to show that certain of the Plan's assumptions were too conservative. Our data show that during the first 10 years of the Plan, projected gains far outpaced losses of older forest, resulting in a net projected increase of between 1.25 and 1.5 million acres of older forest on federally*

> *managed land… The observed rate of gain was about twice the first decadal gain expected under the Plan."* (Moeur et al. 2005:106).

The report goes on to note there was more than expected ingrowth likely because large fires in the late 1800s and early 1900s poised many acres on the brink of late-successional size. In addition, actual harvest of late-successional forest in the ten years following adoption of the Plan was 16,900 acres rather than the 230,000 projected in the 1994 Northwest Forest Plan FSEIS. Fire losses over the same period had a larger than expected effect on some provinces, but the overall rate was within Northwest Forest Plan expectations.

Some of the above-described acreage increase is due to the addition of wider riparian reserves and 100 acre patches of late-successional forest scattered across the Matrix (from the Option 9 analyzed by the FEMAT panels), creating a better web or network of late-successional forest connecting larger reserves. The improved network and increase in acreage are significant, and as a result, late-successional species would be expected to be more secure than estimated in 1994.

The ten-year monitoring report addressed this increased connectivity and overall late-successional forest ecosystem health as well. Given the improvements between the FEMAT report and the final version of the Northwest Forest Plan, along with more detailed inventory information and more time for analysis (the FEMAT developed their entire report in 90 days), the ten-year monitoring report states:

> *"…we perceive the condition of older forest abundance, diversity, and connectivity at the start of the Plan to have been generally consistent with Outcome 2, except perhaps for the provinces of the eastern Cascades. The interpretation for this outcome is that the older forest baseline was within the typical range of conditions that occurred during previous centuries, but less than the long-term presettlement average of 65 percent of the landscape* [Outcome 1] *(USDA, USDI 1994a). Connectivity was strong, characterized by short distances between large older forest patches. The condition of older forest in the eastern Cascades provinces was more typical of Outcome 3, interpreted as below long-term averages, with relative scarcity in some areas or occurring as scattered remnant patches."* (Moeur et al. 2005:106).

This is significant to the functionality of the late-successional forests. The FEMAT estimated Option 9 had a 77 percent likelihood of achieving Outcome 2 or better in the moist provinces *in 100 years,* and a 63 percent chance in the dry provinces (USDA et al. 1993:VI-70). However, this level was essentially achieved by the reserve additions made in the final Plan. The late-successional forest ingrowth in the past 13 years is in addition to, and helps strengthen, these findings. This has significant implications for late-successional forest related species including those included in the Survey and Manage Program.

Finally, the more than 200,000 acre reduction in first decade harvest (from FEMAT projections) (Moeur et al. 2005:106) coupled with silvicultural techniques of green-tree retention, snag and coarse wood retention, smaller unit size, and yarding techniques to minimize disturbance from those likely expected by FEMAT panelists, simply helps to buffer the transition from 1993 conditions to fully functional reserves.

Environmental Consequences

(At the end of this section on page 132, insert:)

For the species eventually placed on Survey and Manage, the FEMAT reported the viability panel's lower ratings as "troubling", and went on to suggest that investigations of these taxa receive priority attention *"because it is widely accepted that the vascular plants, fungi, and lichens, along with the invertebrates, are critically important for the maintenance of ecosystem function and productivity."* (USDA et al. 1993:II-34). While it is no doubt true that species of

vascular plants, fungi, and lichens are important ecosystem components, the role of actually rare species is not well understood (Lyons et al. 2005, Schwartz et al. 2000). The FEMAT scientists themselves chose not to add individual species protection to Option 9, taking the view that there was sufficient late-successional and old-growth forest in the Late-Successional and Riparian Reserves to protect these species, and further protections should await evidence of risk (Thomas et al. 2006).

About 25 percent of the original Survey and Manage species have been removed from the program, primarily because they were found to be common and/or more secure than originally thought. For this discussion, it is assumed some additional number of species would eventually be determined to be more common and/or more secure than currently thought. For example, the recently completed RMS Surveys indicate many species are far more numerous than originally believed, and completion of the survey analysis in the coming months will likely show them to be widespread. More than one-third of the species currently on Survey and Manage had at least one detection, and on average such a detection suggests 7,000 to over 200,000 similarly occupied sites (although the 95 percent confidence bound includes zero for such a single detection) depending upon the sample stratification (see RMS Surveys discussion in the *Background for Effects Analysis* section). Assuming those projected occupied species sites are at least semi-randomly distributed over a range of tens of thousand acres or larger, they would likely be well represented in reserves. From these existing detections, it is possible to mathematically project species numbers and populations for those not detected (and indeed several models are available), but those projections cannot accurately predict extremely rare species (Schreuder et al, 2000). Such projections are used, for example, to predict how many unknown species of a taxa (e.g. insects) there are in the world. Projection techniques preclude the need to continue random sampling with lower and lower likelihoods of finding additional, proportionately rarer species. For example, if the 750 half-acre RMS Survey points were repeated 100 times, for example (75,000 plots), to where a detection represents (on average) about 650 occupied ½-acre sample sites, many more of the Survey and Manage species would be detected, and they would, on average, have populations covering hundreds of acres and more.

There are, however, some Survey and Manage species that still may not be detected at such intensity because they have smaller populations than hundreds of acres. In fact, such a situation is likely. There are mollusks, for example, associated with dry province springs, and lichens in hypermaritime sand dunes, that have fewer than 30 acres of known sites and their habitat is so specialized that it all may have been identified and examined, and all extant sites identified.

If a species is actually rare, there is some risk (perhaps very low) that management activities would significantly negatively impact a species population or even extirpate it from the NWFP area ecosystem (see the *Survey and Manage Species* section later in this chapter). If an actually rare species were extirpated from a significant portion of the NWFP area, there is unlikely to be a significant affect on ecosystem processes or services. Since species numbers increase dramatically as individuals' size decreases, some level of natural extirpation and speciation may be relatively frequent in life forms below the vertebrate and vascular plant level.

If there are Survey and Manage species that are actually rare, they are by definition so uncommon as to not appear at all on most sites. And while their site-specific ecosystem contribution or function is generally apparent, research has not suggested a unique functional role for species so rare. Lyons et al. (2005) and Schwartz et al. (2000) examined research efforts to link biodiversity and rare species to ecosystem function. Lyons et al. noted few examples of uncommon species (defined as approximately 1 to 5 percent of the biomass of the ecosystem studied) playing significant roles. For example, removal of mountain lions led to significantly increased deer numbers, resulting in a variety of vegetation and human interaction issues. A suite of Equisetum species in Alaskan shrub

wetlands making up less than 5 percent of the above and below ground biomass made substantial contributions to phosphorus, potassium, and calcium in litter and soil nutrient pools. Similarly, Lyons et al. identified instances where aggregations of uncommon species fill ecosystem roles. For example, early seral species may be poorly represented in late-successional forest ecosystems, but are important in pioneering disturbed sites after large fires or other disturbances, providing soil stability and sometimes providing significantly high levels of nitrogen and other nutrients. Less common species played important roles in nutrient cycling in an alpine meadow in part because they were able to be active in slightly different times of the season than other species present on the site. Bees too, fall in this latter group; and less common species helped stabilize population variations. Indeed, the role of uncommon species in helping to buffer population variations is the only benefit of uncommon species Schwartz et al. (2000) confidently identified.

None of these studies uncovered a role for actually rare species. In fact, the Schwartz et al. examination of 94 literature references found the majority of biodiversity-ecosystem function studies indicated that most ecosystem function is achieved with relatively few species, and that "evidence in support of a linear dependence of ecosystem function on diversity such that even the rare species contribute to function is practically non-existent" (Schwartz et al. 2000). Schwartz et al. found "little support for the hypothesis that there is a strong dependence of ecosystem function on the full compliment of diversity within sites.

Anecdotal observations support application of these findings in Northwest forest ecosystems. For example, lichens in the genus *Bryoria* make up nearly 100 percent of the winter food for the northern flying squirrel, a prey species for the Northern Spotted Owl and an important distributor of mycorrhizal fungi. However, other species in the *Bryoria* genus are common, and the biomass of the three Survey and Manage *Bryoria* species are an immeasurably tiny fraction of the genus. The loss of one of these species would not likely affect the flying squirrel. While there are examples of single species upon which entire ecosystems rely (coral in atolls, krill in the North Sea), such species are plentiful. Further, these examples do not exist in Pacific Northwest forests, because the ecosystems have been boundless and dynamic. Indeed, pollen deposition studies in the Pacific Northwest dating back to the ice age indicate significant changes in major forest species dominance every 2 to 3 thousand years. The perception that the current suite of forest species evolved together and are therefore irrevocably interrelated in function and thus potentially singularly dependent upon one another is not true. Considerable functional similarity (redundancy) has evolved or migrated here. Researchers estimate, for example, there are approximately 2,000 species of mycorrhizal fungi associated with Douglas-fir roots alone (Trudell et al. 2006). And although different ones perform different functions in space and time, the extirpation of some of these species would thus not threaten the existence of the Douglas-fir forests. The role of such mycorrhizal fungi in facilitating water and nutrient uptake and other functions would continue to be played by the many such species still remaining.

No actually rare species has been identified as serving as a system catalyst, keystone, or gatekeeper. They are simply too rare to be critical to current ecosystem processes; no system could survive if it was dependent on a rare and vulnerable species. If such a role existed, fluctuating climate or fire would not only affect it, but would remove the whole ecosystem as well. Very rare species exist naturally, because of limited special or historic circumstances. The previously cited research does not support the notion that ecosystem function relies upon them.

There are some unusual and limited ecosystems within the NWFP area, such as *Darlingtonia* bogs, where rare species might potentially serve a much larger ecosystem role in such geographically limited systems. No such role has been identified for Survey and Manage species. These systems are appropriately protected through Agencies' Special Status Species Programs or other policies other than Survey and Manage.

Individual species abundance ebbs and flows with disturbance events such as climate change, large fires, landslides, and ice ages. The populations of some currently minor species would no doubt expand, perhaps significantly, with climate change or an ecological disturbance. But even in such cases, the ecological function of such species in Northwest forest ecosystems is likely not unique. The newly fallen ash from Mount St. Helens was colonized by many species, and the absence of one would not have stopped the colonization of those sites.

There appears to be no measurable risk to the functionality of Northwest Forest Plan ecosystems from the potential extirpation of any Survey and Manage species. There is essentially no risk of species extirpation unless species are actually rare (see *Survey and Manage Species* section later in this Supplement). Actually rare species are unlikely to fill any unique role in Northwest Forest Plan ecosystem function.

Wildland and Prescribed Fire

(Replace the entire section on pages 134 to 141:)

Affected Environment

Wildfire and the Ecosystem

Late-successional forest ecosystems in the NWFP area are dynamic and have historically experienced varying levels of disturbance by fire. Historical fire regimes have generally ranged from frequent, low-severity fires in the dry, southern, and eastern provinces to less frequent, high-severity fire regimes in the northern provinces (USDA, USDI, 1994:3&4:17-24,88-91, B-44 to B-46; USDA, USDI 2000a:208). Fire has shaped Northwest Forest Plan landscapes and influenced the habitat and the species that live there (Agee 1990).

Throughout the western U.S, frequent fires once repeatedly reduced surface fuel and created a mosaic of vegetation patches of differing ages, species, and structural attributes. These natural forest patches contribute to the diversity of the broader landscape (Spies 1991a, b , Spies and Franklin 1991). In aggregate, patchiness is integral to landscape function, providing habitats for diverse populations of species. With the absence of fires that generate seral diversity, forest stands may become more uniform in terms of habitat, resulting in reduced biological diversity within and throughout landscapes. Fire suppression has often interrupted natural fire regimes, permitting vast area to accumulate high levels of hazardous fuels and also to become more homogeneous, leading to increase risk of high-severity, stand-replacing fire, damaging insects, disease, and drought. Therefore, the alteration of natural fire regimes by fire exclusion affects ecosystem species composition, diversity, structure, and sometimes species persistence (USDA, USDI 1994a:3&4-83). There is an ecological need to return to more natural fuel levels and fire regimes.

Fuel Hazard Reduction for the Protection of Property, Structures, and Public Safety

In addition to the ecological necessity for treating excessive levels of fuel, there is an urgent and sizable need to reduce the vulnerability of homes, structures and ultimately the safety of those living in the wildland urban interface from uncontrollable wildfire. The protection of life and property is a paramount goal of the National Fire Plan (NFP 2000) (see *National Fire Plan* section below).

Small communities and other developed private lands adjacent to federally managed lands can be directly affected by fuel conditions on those federal lands. Threats posed by fuel accumulations were realized in the summers of 1999 (wildfires in northern California),

2000 (in other western states), 2002 (large wildfires in southern Oregon) and in 2003 (large wildfires in southern California), when wildfires affected urban areas.

The wildland urban interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. The WUI is thus a focal area for human/environment conflicts, such as the destruction of homes by wildfires, habitat fragmentation, introduction of exotic species, and biodiversity decline (Radeloff et al. 2005).

The analysis presented here uses the WUI definition developed by the SILVIS group at the University of Wisconsin. This is the only consistently mapped WUI available to cover the entire Northwest Plan area. WUIs defined in Community Wildfire Protection Plans are expected to be used in actual project-level planning and implementation.

As defined by the SILVIS group, the WUI is comprised of both interface and intermix communities. In both interface and intermix communities, housing density exceeds one structure per 40 acres (16 ha). Intermix communities are places where housing and vegetation intermingle, with vegetation being more than 50 percent and continuous. Interface communities are areas with housing in the vicinity of contiguous vegetation. Interface areas have more than 1 house per 16 ha, with less than 50 percent vegetation, and are within 1.5 mi of areas larger than 1,325 acres that are more than 75 percent vegetated. The minimum size limit ensures that areas surrounding small urban parks are not classified as interface WUI (SILVIS 2006). The adequate protection of communities at risk within the WUI requires a buffer or adjacent area where fuel is treated in order to reduce the risk of, and negative impacts from, wildfire.

National Fire Plan

To address the issue of increased fire size and intensity throughout the west, as reflected in the more than 8 million acres burned nationally in 2000, Congress initiated a National Fire Plan (USDA, USDI 2000b). Activities such as firefighting, rehabilitation and restoration, hazardous fuels reduction, community assistance, and research are included in the plan. The National Fire Plan proposes aggressive hazardous fuels reduction activities to protect communities and at-risk landscapes. In the 2001 appropriations bill, Congress also directed completion of the Forest Service's Cohesive Strategy for Fuels Management and the 10-Year Comprehensive Strategy, which also included direction for implementation and accountability. The related Federal Cohesive Strategy for Fuels Management was released in February 2006.

The Evaluation of Fire Risk and Ecological Conditions

Because of the spatial and temporal variability of natural fire events, the influences of climatic fluctuations, and the uncertainties associated with the use of dendrochronological analysis for fire history dating, an accurate assessment of the amount of acres that historically burned annually is extremely difficult to derive. Fire history reconstructions are very rough estimates and the accuracy and precision of the estimates can only provide relative trends or fire regimes. Using an estimate of historic fire size and frequencies, the 2000 Survey and Manage Final SEIS (p.210) approximated that, on average, 476,000 acres burned annually. This number was used as the basis for approximating the ecological goal for annual fuel treatment in the 2004 FSEIS (p.136). Regularly updated and in the absence of other tools, this information was valuable for inferring ecological needs. Recent severe fire years beg the question of applicability of previous trends. Because of this inherent uncertainty, this Supplement to the 2004 FSEIS uses a different approach, incorporating new technology previously unavailable.

Since 2000, over $12 billion has been allocated and expended on fire related planning, fire ecology research, and fuel reduction programs nationwide under the auspices of the National Fire Plan (http://www.fireplan.gov/resources/reference_library.html). Beginning

before the National Fire Plan, the federal interagency Joint Fire Science research program has made significant contributions to fire related research and technology (http://jfsp.nifc.gov/), including technology and tools to assess landscape scale vegetation structure, fuels, and fire regimes (LANDFIRE 2006, Hann et al. 2005). The purposes of these tools are to 1) Develop an interagency methodology for identifying, quantifying, and reporting ecological departure; and 2) Develop capability for mapping the attributes needed for fire behavior modeling; and 3) Develop mapping using a consistent methodology to portray both the ecological departure and fire behavior variables. Ecological departure is portrayed with a landscape metric known as Fire Regime Condition Class (FRCC). FRCC essentially compares the similarity or lack of similarity of existing conditions of seral stages, fire frequency, and fire severity to modeled historic conditions of these variables. Mapping of FRCC is provided in both the LANDFIRE Rapid Assessment (RA) and in LANDFIRE National. For both products, workshops with local experts were held throughout the country to model the reference conditions needed; LANDFIRE National supplements this with ground data to build the vegetation layers used in the FRCC analyses.

Fire Regime Conditions Classes (FRCC) classify ecosystems into categories that reflect the degree to which a vegetative community is at risk of undesired effects from wildfire. FRCC is an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels and disturbance regimes, and is specifically mentioned in the Healthy Forests Restoration Act to determine ecological departure for fuel treatment needs. Assessing FRCC can help in setting management objectives, identify needs, and assist in determining the location and priorities for fuel treatments (Hann 2003). The Rapid Assessment layers include FRCC, a map of historic fire regimes, the current mix of seral stages, and a potential vegetation layer. The scientific basis for all processes, analyses, methods, and data have undergone peer review and are available at http://www.frcc.gov, http://www.landfire.gov/, and http://www.fireplan.gov/.

Fire Regimes and Departure from Reference Conditions (FRCC)

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention (Agee 1993). Burning by aboriginal peoples has been documented to have influenced Northwest landscapes for hundreds, perhaps thousands, of years and is considered an inseparable factor influencing fire ecology (LaLande 2003, Williams 2002). Coarse-scale definitions for natural (historical) fire regimes have been developed (Schmidt et al. 2002), and interpreted for fire and fuels management (Hann and Bunnell 2001). The five natural (historical) fire regimes are classified based on approximations of the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. Fire regimes are approximations that reflect inherent variability in historic fire frequency, however they provide useful information for understanding and evaluating the extent that landscapes and ecosystems are related, adapted, and dependent on the frequency of fire. These five natural regimes are:

I 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced)

II 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)

III 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced)

IV 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)

V. 200+ year frequency and high severity (stand replacement)

Reference conditions are the range of seral stages, fire frequency, and fire severity characteristic of pre-settlement (for the Northwest, generally prior to 1850) landscapes, and relate directly to the natural fire regimes. Fire regime condition class (FRCC) is an estimate of the amount of departure from natural (typically historic) reference conditions (Hann and Bunnell 2001) (Table 3&4-1.1S). This departure is evident as changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). For ease of communication, departure is aggregated into classes: Condition Class I (low) (0 to <33% departure); Condition Class II (moderate) (33% to <67% departure); and Condition Class III (high) (67%-100% departure) (Hardy et al. 2002, Schmidt et al. 2002, Hann et al. 2005). Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Table 3&4-1.1S. *(New Table)* Fire Regime Condition Class Degree of Departure

Condition Classes	Description	Potential Risks
Condition Class I	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.
Condition Class II	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate.
Condition Class III	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

Fire Regime Condition Class (FRCC) is used as a measure of ecological resilience and sustainability. Ecosystems functioning within a natural range are less likely to experience uncharacteristically severe fires, for example. Note, however, that FRCC is an ecological measure, *not a direct measure of fire risk*. Forests can have high fuel loads and be functioning within the historic range, particularly in longer interval regimes. Variables such as crown base height and crown bulk density are used to determine fire risk, not FRCC.

Social and economic considerations must also be made in forest planning. Further, there are cases where a departure might need to be maintained (e.g., an overabundance of late seral closed forest) for the benefit of endangered species. Reducing FRCC (moving towards the natural range of variation) is therefore not necessarily the same as the desired future condition. It is, however, an indicator of sustainability, particularly in the high fire frequency (short fire return interval) fire regimes.

The Fire Regime Condition Class analysis process was undertaken for the Northwest Forest Plan to evaluate the extent of fuel reduction needs and priorities. Although about 6.5 million acres of FRCC III in the NWFP area poses the highest and most immediate risk,

over 14 million acres is classified as FRCC II, indicating a growing future problem as these FRCC II areas further deteriorate to FRCC III (Table 3&4-1.2S). Currently, it is estimated that there are approximately 4.7 million acres in FRCC II and 9.4 million acres in FRCC III accessible for treatment now. Of these, over 8.2 million acres on federal land are within the WUI and pose an immediate danger to nearby communities and property (Table 3&4-1.3S). An additional 8 million acres in condition class III is on private, state, and county owned land within the WUI. Altogether, there are over 21 million acres of federal and private land in condition class II and III within the WUI within the NWFP area. These figures are indicative of the scale of the fire hazard throughout the West. This analysis underscores the importance, urgency, and enormity of the current fuel hazard reduction issue.

Table 3&4-1.2S. ***(New Table)*** **Federal Acres of Fire Regime Condition Classes in Northwest Forest Plan**

Land Use Allocation	Condition Class II	Condition Class III
Matrix and Adaptive Management Areas (AMA)	4,987,928	2,389,823
Late-Successional Reserves	4,460,361	2,279,756
Withdrawn (non-available) - Wilderness	4,609,743	1,831,299
Total	14,058,032	6,500,878

Table 3&4-1.3S. ***(New Table)*** **Acres of Wildland Urban Interface (WUI) Fire Regime Condition Classes**

Wildland Urban Interface	Condition Class II	Condition Class III
WUI communities at risk	99,934	78,778
WUI communities at risk buffer	5,561,626	2,444,721
Total	5,661,560	2,523,499

The ecological setting for the drier areas of the NWFP area (short fire return internal) and fire exclusion policies has resulted in a significant departure from the historic range of conditions. (See previous *The Evaluation of Fire Risk and Ecological Conditions* section.) The implications of this departure include potential for loss of late-successional forest to severe wildfire (Moeur et al. 2005), with associated negative effects on late-successional species, as well as potential adverse effects on municipal watersheds. Treatment of fuel accumulations through thinning, prescribed burning, and other methods is necessary to protect biodiversity.

Current and Projected Hazardous Fuels Reduction Treatment Programs

The Presidents Healthy Forest Initiative and the Healthy Forest Restoration Act of December 3, 2003 established policy and funding for federal agencies to undertake fuel hazard reduction programs to better care for forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species (http://www.healthyforests.gov/, http://www.whitehouse.gov/infocus/healthyforests/). As a result, both the Forest Service and BLM have made hazardous fuel reduction a high priority, and have been expanding their programs to meet the growing need for aggressive fuel reduction treatments. The two Agencies are currently treating approximately 80,000 acres of hazardous fuels on federal land within the NWFP area annually. Over the last three years, the average annual number of acres treated on BLM Districts was 27,375 acres, and on National Forests was 3,546, as reported in the Fire Plan Operations Reporting System (NFPORS). This figure reflects a summary of all treatments including treatments in WUI, Matrix, and Reserves. Slash treatments associated with commercial timber harvesting, funded, and administered through timber sale contract requirements, are in addition to this acreage. Included in the NFPORS data are projects where more than one treatment per acre may have been necessary. In most places, fuel has accumulated beyond the point where prescribed burning can be used without first reducing the amount of existing hazardous fuel to a level at which fire behavior can be controlled and resources damage minimized. For example,

hand-piling and burning of fuel concentrations is often performed prior to broadcast burning.

Because the need for fuel reduction is much greater than what is currently being treated, the Agencies plan to continue expanding their hazardous fuels reduction programs to achieve both ecosystem restoration objectives and community wildfire protection goals, particularly within the WUI. Over the next ten years it is estimated the hazardous fuel treatment program will grow to approximately 160,000 acres annually (assuming funding is available.) This level is the estimated maximum program capability constrained by implementation logistics, weather, permitted smoke emissions (air quality), workforce, social and other issues (Harbert, S. pers. comm., Fish, W. pers. comm.). This level is not related to the approximation of the total acres in need of fuel reduction treatment derived from historic fire history studies described in the 2004 FSEIS; the total amount of acres in need of hazardous fuel reduction treatments far exceeds the 160,000 acre estimated program. This estimate is the logical amount for assessing effects of the alternatives on the hazardous fuels reduction program because it represents the expected program as it expands over time and as such, addresses the expected effects and costs. However, in order to address current funding levels, the effects of the alternatives on the current 80,000 acre per year fuel hazard reduction program is also analyzed and displayed in tables in this section.

Environmental Consequences

Wildland Fire Use

Wildland Fire Use (WFU) is the management of naturally ignited fires to achieve resource benefits, such as ecological and fuel reduction objectives. WFU may include fires with minimal or delayed suppression actions, when and where the fire does not pose an unacceptable threat to resource values or have the potential to escape the identified WFU manageable area. Wildland fires can be used to mimic historic disturbance patterns, sizes, and intensities (USDA, USDI 2003g). Where and when conditions permit, taking advantage of naturally ignited fires has great potential for achieving resource and ecological objectives at low cost. However, the use of WFU necessitates pre-ignition identification of specific areas in approved management plans. Because many factors are involved in the undertaking of successful WFU (weather, smoke considerations, adjacent private lands and homes, and available fire fighting resources) opportunities for WFU may be limited. Because BLM-administered lands are mostly dispersed among private property at lower elevations, WFU on BLM-administered land is not authorized at this time in the area addressed by this analysis. To date, few WFU plans have been implemented on National Forests in the NWFP area. Because few acres of WFU have occurred since the 2004 FSEIS, and because of the numerous constraints on its use, the number of acres predicted to be treated with this method in the foreseeable future is considered insignificant to this analysis.

Pre-disturbance surveys are not required for WFU in any land allocation (subject to conditions described in Appendix 1, Survey and Manage Standards and Guidelines). Under all alternatives, WFU would remain unaffected. None of the alternatives in the 2004 FSEIS change the acres available for WFU or affect annual costs.

Regeneration Harvesting and Hazardous Fuel Reduction Treatments

Regeneration harvests are generally conducted in mature forests likely having late-successional characteristics. Slash (harvest-generated fuels) treatments associated with commercial regeneration harvesting in late-successional forest stands are funded and administered through sale contract requirements. Such treatments are not considered part of the hazardous fuel reduction program for this analysis. Because pre-disturbance surveys are conducted prior to harvesting (and are thus included in the *Timber Harvest*

section of the 2004 FSEIS), subsequent fuel treatments at the same location do not require additional surveys or incur costs. Because the hazardous fuels treatment need far exceeds program capability, and because not all acres of regeneration harvest are in need of a fuel reduction treatment, fuels treated as part of timber sales do not reduce the acres expected to be treated by the Agencies' hazardous fuels reduction program.

Hazardous Fuel Reduction Treatments

Active fuel treatments include silvicultural practices such as thinning, creating fuel breaks, controlling bark beetle infestations, and hazardous fuel treatments. Hazardous fuel treatments include the use of machines to mulch fuel (mechanical treatment), cutting, hand-piling, and then burning of fuel (manual treatment), and prescribed fire (human ignited and controlled underburning of forest stands to reduce fuel). In some cases, a mechanical or manual treatment is necessary prior to prescribed burning to reduce prescribed fire severity to a desired and safe level.

Recent studies have shown the benefits of fuel treatment (including thinning and prescribed fire) to post-wildland fire tree survival in coniferous forests (Raymond and Peterson 2005). In the Lassen National Forest (Northern California), the 2002 Cone Fire demonstrated that thinned and prescribed-burned forests could survive an intense wildland fire, while adjacent untreated stands burned at high severity (Skinner, C. pers. comm.).

In response to the National Fire Plan, Survey and Manage species Management Recommendation amendments were developed with the intent of allowing greater fuel treatment flexibility around identified "communities at risk." The amendments were designed to allow for fuel reduction activities in known sites of those species occurring within shorter fire return interval areas. Some risk to individual site occupancy was considered acceptable, if this risk would not impair overall species management objectives. These Management Recommendation amendments became effective in 2003 (IM-OR-2003-062, IM-OR-20030O45, http://www.or.blm.gov/surveyandmanage), within a year of the Agencies removing the Survey and Manage Standards and Guidelines. Thus, the full extent of their benefits or shortcomings is unknown. However, for some species, the amendments allow for prescribed fire and other hazardous fuels treatments to be used on and around some Survey and Manage species known sites. For other species, the Management Recommendations allow for very little risk to the site, and prohibit many fuel reduction activities within or near the site.

Evaluation of Alternatives

The evaluation of the environmental consequences considers how implementation of the alternatives may impede, or contribute to, the potential for achieving goals in the following areas:

1. Restoring landscapes to improve, restore, and maintain fire dependent landscapes, communities and habitat diversity, or treating fuels to reduce the probability of undesirable high-severity wildfire.

2. Providing for public safety and the protection of life and property within the wildland urban interface.

It has been demonstrated that the location and type of fuel treatment can substantially influence the rate of spread, intensity and the overall effects of a fire at the landscape scale (Graham and McGaffrey 2003). Carefully planned and strategically placed fuel treatment can moderate undesirable impacts even beyond the treatment area itself.

Because the number of acres in need of fuel treatment far exceed the current and estimated future hazardous fuel reduction treatment capacity of the Agencies, it is important to strategically locate treatments where they will be most effective. Therefore, fuel treatment size, location, method, timing, and relative position on the landscape are important factors in planning and achieving fuel and fire management objectives (Finney 2005). The flexibility to do this varies by alternative. Because the effectiveness of fuel treatments is so dependent on these strategic considerations, especially relative to WUI treatments, the effects of the alternatives are described below as reductions to treatment acres and reduced treatment effectiveness. The difference in effects of the alternatives is largely focused on how they would constrain fuel treatments on late-successional forest acres considered for fuel reduction projects each year.

Comparison of Effects of Alternatives

Alternative 1 continues Survey and Manage. Existing Survey and Manage requirements for species surveys and management of known sites would continue to apply to hazardous fuel treatments. The most effective fuel hazard reduction treatments require contiguous blocks of treated areas planned at the landscape scale. Interruptions in treated areas can create areas of vulnerability, reducing treatment efficacy and cost effectiveness. However, recent modeling and wildfire simulation (Treatment Optimization Model) suggests strategically placed treatments can improve effectiveness where continuity cannot be achieved (http://fire.org/, Finney 2006). Pre-disturbance surveys and the marking and buffering of known sites require time (one to two years) and funding. The narrow "window" for surveys is problematic because of the size of the program (160,000 acres per year). Individual treatment units may span several survey windows because of changes in aspect or elevation, requiring two or more visits by the same surveyors in order to comply with survey protocols for all Survey and Manage species with potential habitat in the project area.

Since about one-third of the NWFP area is late-successional forest, approximately 52,800 of the 160,000 acres estimated to be treated annually would be late-successional forest. As described in the 2004 FSEIS *Timber Harvest* section, managed species sites are projected to occupy 15 percent or 7,920 acres of the late-successional portion of the acres proposed for treatment (although all actual sites and required surveys are not necessarily limited to such stands) (2004 FSEIS:225). Annually, approximately 62 percent of fuel treatments use mechanical methods, thus requiring 4,910 acres to be managed as known Survey and Manage species sites. Prescribed fire constitutes 38 percent of fuels treatments, requiring 3,010 acres to be managed as known sites. However, burning conditions around some known sites would necessitate additional buffering. On average, this additional buffering would prohibit burning on three times more acres than would actually be contained in known sites (FSEIS 2004). For hazardous fuel treatments using prescribed fire, it is estimated that 9,030 acres of the acres proposed for treatment annually would be minimally treated or left untreated to mitigate negative impacts to known sites. Thus under Alternative 1, it is projected that approximately 13,940 total acres would be managed for known sites (Table 3&4-2S). This level of known site management (8.7 percent of the average treatment area), especially in the WUI, would reduce efficiency and efficacy of hazardous fuel treatments by compromising the placement and methods available for treatment.

Under Alternative 2, the acres of fuel treatment would also be reduced by the need to manage known sites for Special Status Species Program goals. However, fewer species are included in the SSSP compared to Survey and Manage. In addition, local managers could identify some known sites as not needed to meet SSSP goals (with the latitude to focus on those most difficult to protect).

Since about one-third of the NWFP area is late-successional forest, approximately 52,800 of the 160,000 acres estimated to be treated annually would be late-successional forest. As

described in the 2004 FSEIS *Timber Harvest* section, managed species sites are projected to occupy five percent or 2,640 acres of the late-successional portion of the acres proposed for treatment (although all actual sites and required surveys are not necessarily limited to such stands) (2004 FSEIS:225). Annually, approximately 1,637 acres within mechanical treatment areas and 1,003 acres within prescribed burning fuel treatment areas (62 and 38 percent respectively), prior to buffering, would be managed as Survey and Manage known sites.

For hazardous fuel treatments that employ prescribed fire, burning conditions around some known sites would necessitate additional buffering to protect known sites. However, additional buffering would be less under Alternative 2 than under Alternative 1 due to flexibility in local management decisions. On average, this additional buffering would prohibit burning on one and a half times more acres than would actually be contained in known sites (FSEIS 2004), or 1,505 acres would be managed as known sites and additional buffering. Thus under Alternative 2, it is projected that approximately 3,142 total acres would be managed for known sites (Table 3&4-2S). This level of known site management (2.0 percent of the average treatment area) is generally compatible with accomplishment of fuel treatment and protection objectives. The level significantly improves the potential efficiency and efficacy of hazardous fuel treatments when compared with Alternatives 1 and 3, by providing more flexibility in treatment location method and timing. This is particularly important in the WUI where gaps in fuel treatments increased risk of fire spread to structures.

Additionally, more flexible pre-project clearance protocols and protection options reduces both survey and planning lead time, reducing cost and logistical problems when compared to Alternative 1 and to a lesser degree, Alternative 3.

Under Alternative 3, the acres of fuel treatment would be reduced by the need to manage sites for Category A, B, and E species and, with significantly more flexibility, 14 SSSP species. For the SSSP species, local managers could identify some known sites as not needed to meet SSSP goals (prevent listing under the Endangered Species Act and, for the Forest Service, meet the Forest Service viability and diversity requirements.) Eighteen uncommon species would not be included in Survey and Manage or SSSP, generally those with the most known sites, and 272 species would remain on Survey and Manage.

Since about one-third of the NWFP area is late-successional forest, approximately 52800 of the 160,000 acres estimated to be treated annually would be late-successional forest. As described in the 2004 FSEIS *Timber Harvest* section, managed species sites are projected to occupy seven percent, or 3,696 acres, of the late-successional acres proposed for treatment (although all actual sites and required surveys are not necessarily limited to such stands) (2004 FSEIS:225). Annually, approximately 2,292 acres within mechanical treatment areas and 1,404 acres within prescribed burning fuel treatment areas (62 and 38 percent respectively), prior to buffering, would be managed as Survey and Manage known sites.

For hazardous fuel treatments that employ prescribed fire, burning conditions around some known sites would necessitate additional buffering to protect known sites. On average, this additional buffering would prohibit burning on two times more acres than would actually be contained in known sites (FSEIS 2004), or 2,809 acres would be managed as known sites and additional buffering. Thus under Alternative 3, it is projected that approximately 5,100 total acres would be managed for known sites (Table 3&4-2S). This level of site management (3.2 percent) is greater than in Alternative 2, but substantially less than Alternative 1. This level is generally compatible with fuel treatment and protection objectives, although site concentration areas are likely to create efficacy problem areas. Alternative 3 significantly improves the potential efficiency and efficacy of hazardous fuel treatments when compared with Alternative 1.

Additionally, more flexible pre-project clearance protocols and protection options for the SSSP portion of the species, and the reduced number of Survey and Manage species, reduces both survey and planning lead time, reducing cost and logistical problems when compared to Alternative 1, but not as much as Alternative 2.

Table 3&4-2S. Acres of Hazardous Fuel Treatment (Projected)

Acres	Alternative 1	Alternative 2 (Un-Mitigated)	Alternative 3 (Un-Mitigated)
Proposed annual fuel treatment	160,000	160,000	160,000
Known site management	-13,940	-3,142	-5,100
Actual fuel treatment	=146,060	=156,858	=154,900

Table 3&4-2S. Acres of Hazardous Fuel Treatment (Current)

Acres	Alternative 1	Alternative 2 (Un-Mitigated)	Alternative 3 (Un-Mitigated)
Proposed annual fuel treatment	80,000	80,000	80,000
Known site mitigation	-6,960	-1,600	-2,560
Actual fuel treatment	=73,040	=78,400	=77,440

Survey Costs

The cost of surveys was analyzed and derived in the 2004 FSEIS. All cost figures were brought forward from this analysis and remained unchanged.

Under Alternative 1, pre-disturbance survey costs are estimated at $69.86 per acre (see *Cost of Management* section). Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 176,000 acres (160,000 acres + 10 percent), total pre-disturbance survey costs for hazardous fuel treatments under Alternative 1, would be $12.3 million annually. When the total survey cost is divided by the actual treatment acres, the cost is $84.18 per acre (see Table 3&4-3S).

Under Alternative 2, pre-project clearance survey costs would be $30.39 per acre (see *Cost of Management* section FSEIS 2004). Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 176,000 acres (160,000 acres + 10 percent), total pre-project clearance survey costs for hazardous fuel treatments under Alternative 2 would be approximately $5.3 million annually. When the total survey cost is divided by the actual treatment acres, the cost is $34.10 per acre (Table 3&4-3S).

Under Alternative 3, pre-disturbance survey costs would be $63.43 per acre (see *Cost of Management* section FSEIS 2004). Management activities in non-late-successional stands would be exempt from survey and manage species pre-disturbance surveys, so 67 percent of the treatment area would not require surveys. Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 58,080 acres (160,000 x .33 + 10 percent), total pre-disturbance survey costs for hazardous fuel treatments under Alternative 3 would be approximately $3.7 million annually. When the total survey cost is divided by the actual treatment acres, the cost is $23.78 per acre (Table 3&4-3S).

Table 3&4-3S. Costs of Hazardous Fuel Treatments – Surveys (Projected)

	Alternative 1	Alternative 2 (Un-Mitigated)	Alternative 3 (Un-mitigated)
Survey cost per acre	$69.86	$30.39	$63.43
Total acres surveyed	x 176,000	x 176,000	x 58,080
Total cost	= $12,295,360	= $5,348,640	= $3,684,014
Acres of treatment	/ 146,060	/ 156,858	/ 154,900
Survey costs per treated acre	= $84.18	= $34.10	= $23.78

Table 3&4-3S. Costs of Hazardous Fuel Treatments – Surveys (Current)

	Alternative 1	Alternative 2 (Un-Mitigated)	Alternative 3 (Un-mitigated)
Survey cost per acre	$69.86	$30.39	$63.43
Total acres surveyed	x 88,000	x 88,000	x 29,040
Total cost	= $6,147,680	= $2,674,320	= $1,842,007
Acres of treatment	/ 73,040	/ 78,400	/ 77,440
Survey costs per treated acre	= $84.17	= $34.11	= $23.79

Under all alternatives, treatment costs per acre vary from $50 to $150 for prescribed fire and from $400 to $600 for mechanical treatments. Treatment costs are generally higher around known sites for Survey and Manage and Special Status Species because treatment methods are limited and prescribed fire is more likely to be prohibited. Treatment costs would increase to $550 per acre for known sites where prescribed fire is used. Under Alternative 1, based on the amount of late-successional forest and projected known sites (in the acres actually treated annually with prescribed fire), each year an estimated 2,747 acres would have these increased costs. This would result in a total increased cost of approximately $1.5 million annually. Averaged across all the acres treated, this would result in an increased cost of $10.35 per acre ($1,511,064/146,060 acres).

Under Alternative 2, based on the amount of late-successional forest and projected known sites (in the acres actually treated annually with prescribed fire), it is estimated that each year 983 acres would have these increased costs. This would result in a total increased cost of approximately $0.5 million annually. Averaged across all the acres treated, this would result in an increased cost of $3.45 per acre ($540,925/156,858 acres).

Under Alternative 3, based on the amount of late-successional forest and projected known sites (in the acres actually treated annually with prescribed fire), it is estimated that each year 1,360 acres would have these increased costs. This would result in a total increased cost of approximately $0.7 million annually. Averaged across all the acres treated, this would result in an increased cost of $4.83 per acre ($747,842/154,900 acres).

These increased costs, added to survey costs and multiplied by total treatment acres, result in total costs to the fuels program to manage Survey and Manage or Special Status Species Program species (Table 3&4-4S).

Table 3&4-4S. Summary Comparison of Fuel Treatment Acres and Total Costs (Projected)

	Alternative 1	Alternative 2	Alternative 3
Hazardous fuel treatment (annual acres)	146,060	156,858	154,900
Survey cost (per acre)	$84.18	$34.10	$23.78
Additional treatment costs to manage sites (average per treated acre)	$10.35	$3.45	$4.83
Total per acre survey and increase burning costs	$94.53	$37.55	$28.61
Total costs for Survey and Manage or Special Status species	$13,807,052	$5,890,018	$4,431,689

Table 3&4-4S. Summary Comparison of Fuel Treatment Acres and Total Costs (Current)

	Alternative 1	Alternative 2	Alternative 3
Hazardous fuel treatment (annual acres)	73,040	78,400	77,440
Survey cost (per acre)	$84.17	$34.11	$23.79
Additional treatment costs to manage sites (average per treated acre)	$10.35	$3.45	$4.83
Total per acre survey and increase burning costs	$94.52	$37.56	$28.62
Total costs for Survey and Manage or Special Status species	$6,903,741	$2,944,704	$2,216,333

Wildland Urban Interface

In addition to the financial costs of species surveys and working around known sites, known site management can create logistical constraints on placement of treatments. Since current policy on these treatments emphasizes the importance of carefully placed landscape treatments (Finney 2005) to modify fire behavior, rather than random placement, effective treatments could be constrained by species site locations or delayed by species surveys, as discussed above. This concern is even more evident in the WUI where treatments (or lack of treatments) have implications for protecting communities.

There are approximately 4.7 million acres of FRCC II and III in the WUI available for fuel treatment (Table 3&4-4.1S). Of these approximately 1,548,958 acres, or one-third, is late-successional, and 34 percent and 22 percent of the late-successional forest in WUI is in FRCC III and II respectively.

Based on calculations above, Alternative 1 is projected to have approximately 8.7 percent of the WUI managed as known sites. Although exceptions and additional flexibility is provided by Management Recommendations in some situations for some species (http://www.blm.gov/or/plans/surveyandmanage/), such sites minimally treated or untreated can compromise fuel break continuity and place communities at greater risk and vulnerable to wildfire control and escape. Areas left untreated across the landscape can contribute to uncontrollable wildfire behavior and amplify the risk to communities as well as create an increase in suppression costs and a danger to fire fighters. The potential for spotting (the term used to describe embers spreading ahead of a fire when a fire burns intensely in untreated areas), is greatest under Alternative 1. Such spotting is considered the primary ignition source for homes and other structures that catch on fire during a wildfire (Cohen 1991, Cohen and Wilson 1995, Cohen and Saveland 1997). Because known site management would be reduced under Alternatives 2 and 3 to 2 and 3.2 percent respectively, they provide greater flexibility for successful treatments in WUI.

Table 3&4-4.1S. *(New Table)* Fire Regime Condition Class and Late-successional Forests Within the Wildland Urban Interface

	FRCC II	FRCC III
Matrix and Adaptive Management Areas	1,824,314	851,616
Late-Successional Reserves	1,309,712	708,170
Total available acres for hazardous fuel reduction	3,134,026	1,559,786
Unavailable or withdrawn	(1,939,695)	(963,712)
Percent of late-successional forest in each FRCC Class	23	34

Environmental Consequences Summary

Given that needed fuel treatments significantly exceed program capability, cost differences between alternatives can reasonably be converted to potential additional acres treated for comparison purposes. (Actual treatment levels may be constrained by other factors.) Projected treatment acres are 146,060, 156,858, and 154,900 for Alternatives 1, 2, and 3 respectively (Table 3&4-4.2S). Survey and known site management costs by alternative, as

well as the cost "savings" for Alternatives 2 and 3 when compared to Alternative 1, are shown in Table 3&4-4.2S. If this cost saving were available for hazardous fuels reduction, it could possibly fund upwards of 15,000 acres and 18,000 additional acres of treatment, respectively. Combined with the increased efficiency and effectiveness of treatments under Alternatives 2 and 3, this acreage strategically placed in the WUI could potentially prevent serious lose of property, life and perhaps an entire community at risk.

Given the disparity between treatment needs and capabilities, WUI and ecological goals will likely be achieved only at the local or watershed level for the foreseeable future regardless of the alternative selected. Nevertheless, these local achievements can be very worthwhile in protecting communities, maintaining habitats, and restoring fire regimes.

Table 3&4-4.2S. ***(New Table)*** **Summary Comparison of Fuel Treatment Acres Potentially Forgone (Projected)**

	Alternative 1	Alternative 2	Alternative 3
Projected treatment acres (Table 3&4-2S)	146,000	156,858	154,900
Total costs for Survey and Manage or Special Status species (from table 3&4-4S)	$13,807,052	$5,890,018	$4,431,689
Annual cost savings over Alternative 1		7,917,035	9,375,363
[1] Potential acres treated with cost savings (at $500.00 per acre treatment cost)		15,834	18,751
Relative difference between alternatives expressed as projected plus potential treatment acres	146,000	170,858	171,800

Table 3&4-4.2S. ***(New Table)*** **Summary Comparison of Fuel Treatment Acres Potentially Forgone (Current)**

	Alternative 1	Alternative 2	Alternative 3
Projected treatment acres (Table 3&4-2S)	73,040	78,400	77,440
Total costs for Survey and Manage or Special Status species (from table 3&4-4S)	$6,903,741	$2,944,704	$2,216,333
Annual cost savings over Alternative 1		$3,959,037	$4,687,408
[1] Potential acres treated with cost savings (at $500.00 per acre treatment cost)		7,919	9,375
Relative difference between alternatives expressed as projected plus potential treatment acres	73,040	85,598	85,963

1 $500.00 is the mid-point of mechanical hazardous fuel reduction cost range $400.00 to $ 600.00 (2004 FSEIS p140).

(On page 141 ahead of the "Bryophytes" heading, insert:)

Survey and Manage Species

Affected Environment

New Information about Survey and Manage Species

Following adoption of the Survey and Manage Program, the Agencies combined known location data from extensive searches in herbaria and museums with data from agency files, individuals, and publications to develop the first known site database for the Program. When assembled in 1998, the database had approximately 19,000 records; half were lichens from a Forest Service regional air-quality study. By January 2005, the Agencies had collected more high quality information on a wide variety of rare and uncommon species than had ever been attempted by the federal government. Species site data had increased to 68,000 records. Records for some taxa doubled, increased approximately fourfold for fungi, fivefold for bryophytes, and nearly fourfold for mollusks, constituting an unprecedented data set on these poorly known taxa. Agencies now have a better understanding of the distributions, abundances, and habitat associations

of species associated with mature and old-growth forests (Molina et al. 2006). Species site databases are accessible to over 600 users including specialists at each administrative unit.

Draft or Final Management Recommendation documents are available for over 300 species. Management Recommendations for each species provide detailed information on natural history (taxonomy, descriptions, biology, ecology, distribution, habitat, and abundance), current species status (threats, distribution relative to land allocations), and guidelines to maintain suitable habitat for species persistence at the site scale and suggested research and information needs to better understand species ecology and site management and monitoring needs to address status and trends (Molina et al. 2006). These documents are now available to assist management of these species, whether they are under the Survey and Manage Program or the Agencies' Special Status Species Programs.

From the beginning of the Survey and Manage Program, extensive and general regional surveys were required for 354 of the 404 species. These surveys were considered the key approach to gathering new information on the conservation needs and distribution of each species within the 24.4 million acre NWFP area. Following redesign of the Survey and Manage Standards and Guidelines in 2001, which lumped extensive and general regional surveys into "Strategic Surveys" and assigned the requirement to every species, Molina and others developed a strategic survey framework that described an iterative adaptive management process for acquiring data and managing species (Molina et al. 2003). The framework called for evaluating and prioritizing information needs on all species, designing and implementing strategic surveys, and analyzing surveys results relevant to species and habitat management. This approach addressed high-priority questions, especially distribution in reserves or association with late-successional forest habitat (Molina et al. 2006).

Strategic surveys took several approaches depending upon the objective and the information needs of the species. Because the information from these surveys would assist future management of these species (including decisions about assignment to, and management under, the Agencies' Special Status Species Programs), RMS Survey, and other strategic surveys were completed (at a cost of over $8 million) even though a decision had been made to eliminate the program. Analysis of collected data is nearly complete, and results are now beginning to be published. This task, when completed, will largely accomplish the FEMAT's only recommendation about these species, that "Investigation of these taxa should receive priority attention..." (USDA et al. 1993:II-34).

Approximately 450 RMS detections were recorded for the 106 of the species currently on Survey and Manage. (Several species are on Survey and Manage in only a portion of the NWFP area, being deemed common or secure in other areas. The 450 detections include only those in areas where the species is included in Survey and Manage.) Nearly two-thirds of the detections were fungi, and nearly one-quarter were lichens. Results showed, however, that three-quarters (of the 106 species detected) occurred on 5 or fewer plots, half occurred on only 1 or 2 plots, and nearly two-thirds of the Survey and Manage species were not detected on any plot (Table 3&4.8S) (vertebrates were excluded from this survey). The results confirmed expectations that this broad-scale type of RMS Survey was not likely to detect extremely infrequent species (Molina et al. 2006). The primary conclusion that can be drawn from the results relates to overall population sizes. A single detection indicates, on average, from 7,000 to over 200,000 occupied sites over the entire NWFP area (depending upon the stratification of the survey plots), although 95 percent confidence limits surrounding one and two detections includes zero (see RMS Surveys discussion in the *Background for Effects Analysis* section.) Three or more RMS Survey detections translate to thousands of sites, and RMS Survey detections indicate hundreds of thousands of occupied sites for some species. Conversely, species with fewer than 3,500 to 100,000 actual sites within the NWFP area essentially had less than a 50 percent chance of being detected with this survey. Populations would likely be higher than indicated by the survey, because

in spite of thorough searches by specialists, there is some level of failure to detect species actually present.

Even without completion of the statistical analysis for each species, it is clear that the RMS Survey detections have succeeded in shedding new light on Survey and Manage species. Until now, many observers assumed low known site numbers meant species are indeed rare. For example, more than half of Survey and Manage species are known from fewer than 15 sites, 44 percent are known from 10 or fewer sites, and 30 percent from 5 or fewer sites. As many predicted, however, the RMS Survey points are showing many species to be more numerous than previously known. For example, two species detected on the RMS Survey previously had no confirmed sites in the NWFP area. Another four species detected were previously known from only one site. Two other species detected were previously known from only two sites, and another two previously had only three known sites. And so forth. These detections are for Category B species, ones for which characteristics of the species makes them impractical to find during pre-project surveys (e.g. they are too small to be detected, don't show themselves regularly and predictably, can't be separated from other species outside of a lab, etc.), so they understandably appeared rare in Agencies' databases.

The fact that low site numbers can be at least partially attributed to difficulty of detection is borne out through comparisons of site numbers for species which can be detected in practical pre-disturbance surveys, Survey and Manage Categories A and C, and those that cannot, Categories B, E, F, and most species in Category D. Categories A and C species average 113 sites per species, while the non-survey categories average 28 (discounting former survey species now in Category D). Similarly, the rarest 1/3 of the Categories A and C species are known from 15 or fewer sites, while the rarest 1/3 of the non-survey categories are known from five or fewer sites. Thirty percent of non-survey species are known from 1 or fewer sites, compared to only 5 percent of Categories A and C species. It is clear that apparent rarity for some species is at least partly a function of the difficulty of detecting them during surveys.

It is true, however, that RMS Survey detections were less common for species known only from five or fewer sites. And while there are species with only 6, 7, and 8 known sites for which 3 RMS Survey detections is part of that number, the likelihood of one of the 92 species with 5 or less known sites being detected during an RMS Survey was only 15 percent (14 of 92). Conversely, the 92 most numerous species (those with 45 known sites or more) had a 47 percent likelihood of being detected by the RMS Survey (43 of 92.) Clearly many apparently rare species are not actually rare. Many others may be rare, but simply may have population sizes below the tens of thousands needed to expect an RMS Survey detection. In any event, classic sampling designs are not efficient for rare species (Yoccoz et al. 2001).

Without the completed analysis of the RMS Survey data, species experts faced with several RMS Survey detections remain concerned about connectivity, distribution, whether the species are in the reserves, and what the RMS Survey detections mean. Of the 61 species in this Supplement with insufficient habitat caused by Alternative 2 in all or part of their range, the lichen *Pseudocyphellaria rainierensis* has 296 known sites and 6 RMS Survey detections. The lichen *Nephroma occultum* has 228 known sites and 3 RMS Survey detections. The fungus *Phaeocollybia attenuata* has 155 and 6, the fungus *Ramaria rubripermanens* (in Oregon) has 142 and 9, and the fungus *Rameria araiospora* has 125 and 11. However, for reasons of habitat, dispersal, continuity, risk, uncertainty, or other reasons, species experts cannot confidently and scientifically say individual species would remain well distributed with function and gene flow similar to their historic distribution.

Environmental Consequences

There are 295 Survey and Manage species considered in this Supplement. New information (including newly discovered sites) published or recorded since the 2004 FSEIS has been incorporated into the individual species analyses in the following sections. Where new information indicates a change in outcome from the 2004 analysis, those changes have been made and affected tables and conclusions have been revised and included in this Supplement.

Agency taxa specialists determined species outcomes based on numerous factors including (1) the extent of the reserve system; (2) Matrix and Adaptive Management Area Standards and Guidelines; (3) provisions for species management under the Survey and Manage or Special Status Species Programs; (4) species range, distribution, and populations; (5) species life history and habitat needs; and, (6) the number and location of known sites. Information from FEMAT; the Northwest Forest Plan Final SEIS; the 2000 Survey and Manage Final SEIS; the Annual Species Reviews; and Interagency Species Management System (ISMS) database, along with the professional knowledge of biologists and botanists was used to make the determination. Since each species has different life histories, ranges, distributions, and habitat needs, it is nearly impossible to devise precise thresholds for determining outcomes. Determinations are based on the evaluation of experts and tend to be more qualitative than quantitative in nature (2004 FSEIS:121).

The uncertainty surrounding Survey and Manage species and the emphasis that a strategy ensure protection of various resources has generally led to a high level of caution when the long-term effects of various management strategies (alternatives) are considered. The outcomes in the 2004 FSEIS borrow from those used in the 2000 Survey and Manage FSEIS (USDA, USDI 2000a:189-193). Guidance for the determination of outcomes includes:

1. For species with relatively few, highly isolated sites or populations, with little to no potential for gene flow between them – may be known from a single site – loss of any sites might be considered a dire condition and the species assessed as becoming not well distributed.

2. For species distributed as groups or clusters of occurrences or subpopulations, with some potential for dispersal and/or gene flow within the groups but little potential for dispersal or gene flow between isolated clusters, loss of single sites, multiple sites, or clusters that serve a significant role for population persistence or in the species' biological diversity might result in a determination of not well distributed.

3. Species in groups or clusters of occurrences or subpopulations (some as strings of sites) with intra-cluster connectivity and some potential (based on species-specific spatial scale or configuration, over appropriate time periods) for connectivity among isolated sites or isolated site clusters, would be determined not well distributed if they lose sites or clusters that affect overall population persistence, such as source subpopulations, those within connectivity areas, or loss of genetic and biological diversity of the populations. Loss of a cluster for species with few clusters, relative to species range, distribution, and effective population size, could result in a species becoming not well distributed.

4. For species with multiple avenues of connectivity among sites and clusters, it might be possible for species to remain well distributed with numerous losses of non-significant sites and connections among sites and some gaps in distribution. However, fragmentation could be a serious risk to population stability and the projected distribution pattern need not completely change to the limited connectivity category for it to become not well distributed.

The analysis (as updated by this Supplement) now indicates that under all alternatives, 131 species are determined to have insufficient habitat to support stable populations in the

NWFP area, 1 (red tree vole) has insufficient habitat in a portion of its range, and 18 have insufficient information to determine an outcome.

Under Alternative 1, Survey and Manage, 146 species have sufficient habitat to support stable populations in the NWFP area.

Of the 146 species with sufficient habitat under Alternative 1, 61 are projected to have insufficient habitat to support stable populations because of management under Alternative 2 (and 14 under Alternative 3) in all or part of their range (Table 3&4-4.3S).

Table 3&4-4.3S. *(New Table)* Species Outcomes Summarized by Taxa

TAXA GROUP	Sufficient Habitat Under All Alternatives	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Fungi	30	3	115	38	6
Lichens	13	9	16	2(1[1])	2
Bryophytes	9	5	-	1	-
Vertebrates	6	-	0(1[1])	(6[1])	(5[1])
Mollusks	25	1	0	10(2[1])	-
Vascular Plants	12	-	0	(1[1])	-
Total:	95	18	131(1[1])	51(10[1])	8(6[1])

[1] Species with sufficient habitat range-wide, but with insufficient habitat in a portion of the range.

Because the legal question relevant to this analysis is whether diversity and viability regulations are met (on the National Forests) and whether forest ecosystem function is at significant risk, some basic parameters about these 61 species are worth highlighting here.

For five of six vertebrate species, habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although under Alternative 2 there is insufficient habitat to support stable populations in a portion of the NWFP area (and for four species under Alternative 3). The sixth species (red tree vole) has insufficient habitat in a portion of it range under all alternatives, and insufficient habitat in an even larger portion of its range under Alternative 2 and 3.

For the 38 fungi with insufficient habitat under Alternative 2, only 3 have fewer than 20 known sites (10, 16, and 19), and these are Category B species for which pre-disturbance surveys have not been conducted (Table 3&4-9S and 3&4-8S). Six fungi are known from over 100 sites. Twenty-five of the 38 species had detections on the RMS Survey plots, with 18 of these having three detections or more and 9 having nine detections or more.

Two lichens are predicted to have insufficient habitat in the NWFP area. These each have over 200 known sites, have three or more RMS Survey detections, and both are assumed to be on one or more of the Agencies' Special Status Species programs under Alternative 2.

The one bryophyte is known from only two known sites, and although it is aquatic, there is expressed concern that management within the Riparian Reserve and activities in a reservoir upstream from one of the known sites might place it at risk. It is a Category B species, pre-disturbance surveys not practical. Its global distribution includes Europe, northeastern United States, and is has also been reported from British Columbia and Alaska (USDA, USDI 1997).

The six vertebrates were all found to have sufficient habitat to support stable populations across the NWFP area, but have insufficient habitat in a portion of their range. All still meet the 1982 NFMA viability and diversity regulations without mitigation. The salamander effects discussions make such a determination; the concern is primarily about gaps and gene flow. The Oregon red tree vole insufficient habitat finding applies only to expanded areas of the vole's range, where it has more recently been discovered. For the

Great Gray owl, the preponderance of the range is outside the NWFP area and overall population stability is not an issue.

Nine of the ten mollusks with insufficient habitat in the NWFP area under Alternative 2 are unnamed (specified only by genus and a number) and would not qualify for Survey and Manage under the current standards and guidelines for adding species (USDA, USDI 2001a Attachment 1:15). Similarly, because they are not described and named in peer reviewed literature, they did not qualify for placement in the Forest Service Region 5 Special Status Species Program, a decision which seemed to contribute to their "insufficient habitat" outcome under Alternative 2 (although several of these are known from few sites, most are aquatic). The recently named species will presumably now qualify for SSSP in California.

Two other named mollusks were determined to have insufficient habitat in a portion of their range. One of these has over 200 known sites and 2 RMS Survey detections. For the other, most known sites are included in the Forest Service Special Status Species Program in Oregon and California. However, with only15 known sites in the NWFP area, there is concern over the loss of the few BLM sites. This species' range extends into the Pitt and Sacramento River drainages outside the NWFP area.

The one vascular plant with insufficient habitat in a portion of its range has over 650 known sites and is only included in Survey and Manage in part of its range.

The "risk" to most if not all of these species appears limited to the potential to remove the species from some portion of its historic range, to remove individual populations, or to inhibit gene flow. For most of these, there appears to be very limited risk to extirpating the species over much of its range, particularly considering its entire range irrespective of the NWFP area boundary.

There are 18 species (5 bryophytes, 3 fungi, 1 mollusk, and 9 lichens) and 4 functional arthropod groups with insufficient information to determine an outcome, and 131 species (115 fungi and 16 lichens) projected to have insufficient habitat under any alternative. These species may, because of management or stochastic events, develop gaps or be extirpated in all or part of their range in the NWFP area. While the potential for such an event may increase with the removal of Survey and Manage, there is no way to predict that increase. Most of these species cannot be found with practical pre-disturbance surveys.

Assessing Ecological or Species Risk

As noted in the *Late-Successional Forest Ecosystem*s section of the 2000 FSEIS, risk is a function of four essential elements: value, susceptibility, hazard, and exposure. The removal of any of these elements alters the risk landscape. Removing the Survey and Manage provisions does not automatically create risk. Removing pre-disturbance surveys (for Categories A and C species), and removing known site management, increases exposure to hazards (management activities). If species are resistant to that hazard (susceptibility), for example if the species lives in talus slopes or persists in down logs, they are less susceptible. (USDA, USDI 2000a:204). Finally, the significance of risk is related to value. In the case of species, there are two identifiable values; the value society (as embodied in laws and regulations) puts on not losing any species, and the value of species to the process and function of ecosystems in which they live.

The background discussion for the species outcomes identifies each of the above points, and others, as sources of uncertainty in the expert assessments (outcomes). Uncertainty is identified to come from:

1. Limited knowledge of species life history including habitat relationships, reproductive characteristics, survival, and dispersal characteristics.
2. Limited knowledge of the historical status of species.

3. Limited knowledge of the current status or trend of species populations other than information on known sites.
4. Uncertainty concerning the effects of habitat-disturbing activities on species.
5. Uncertainty surrounding the exact type and location of activities that would be conducted on federally managed lands.
6. Uncertainty concerning activities on non-federal lands.
7. Uncertainty about the type, location, timing, and intensity of natural disturbances (USDA, USDI 2000a:192).

Specifically, species experts have generally assumed that unprotected known sites in Matrix would not remain occupied, however actual disturbance from timber sales or other management activities may be decades away or may not happen at all. West of the Cascades, Riparian Reserves making up over 50 percent of the landscape significantly reduce the likelihood that a species site of any size would be entirely affected by a management activity. Further, if disturbances do happen, they may not extirpate the species from the site. For example, many prescribed fire treatments occur in ecosystems where frequent fire is normal (albeit seasonally different), and all types of treatments are designed to minimize soil disturbances. Such activities do not necessarily eliminate a species from the project area, even though, for analytical purposes, the species experts may have made the presumption that such species cannot tolerate such disturbances. Even regeneration harvest units are limited in size, are often adjacent to riparian or other reserves, and are required to retain certain levels of green trees, snags, and down logs, precisely for the purpose of retaining local populations of relatively non-mobile life forms. Thus, both exposure and hazard may be over-estimated.

Species experts have been hesitant to assume there are more actual sites than those currently documented. There are actually more species sites extant than can be discovered in strategic or pre-disturbance surveys, because many species are very small or show themselves (break the surface) only seasonally. Indeed only 63 of the 300 or so Survey and Manage species can be detected by practical field surveys. Further, survey protocols generally call for sampling transects, not 100 percent coverage, in order to maintain practicality and because searches seek detectable populations, not necessarily individuals. The magnitude of this issue is demonstrated with the RMS Survey plots. At these plots, experts used rakes to thoroughly search for hypogeus fungi on 658 0.01 hectare plots. The results included 13 detections for a species known only from 7 other federal sites, and 3 detections for a species known only from 6 other total sites. These species have previously been assumed to be rare because so few sites were known.

Species experts have been hesitant to make population assumptions in reserve land allocations. Although pre-disturbance surveys within proposed harvest units to date have covered about 16 percent of the Matrix and have detected thousands of sites, most detections come from non-random sampling in Matrix. This information is limited in its usefulness, because no accurate populations can be estimated nor habitat associations determined from non-random sampling. Statisticians warn against using such data to make population inferences to nearby reserves – even where populations are known on either side of a reserved area. Because of this, and because most known sites are in Matrix where they are assumed to be at risk from management activities, experts often conclude species with dozens to hundreds of known sites are inadequately protected. Eleven of the 61 species with insufficient habitat because of management under Alternative 2 are known from more than 100 sites. The results of the RMS Surveys (discussed elsewhere in this chapter) should help resolve this issue and help provide a basis for drawing broader population size conclusions. However, statistical analysis of results is not completed. In addition, RMS Surveys may not answer connectivity questions.

Species experts have assumed many species are simply at greater danger from current conditions and stochastic events. Harvesting has made Pacific Northwest late-successional forests less inter-connected than during most prehistoric times, so there are legitimate

concerns about the long-term prospects for certain rare species. Human-caused pollution and the threat of unnaturally hot wildfires because of recent suppression of natural fire events may also be threats. However, fluctuations in climate over the last 10,000 years (see *Late-Successional Forest Ecosystems* section), related changes in forest structure, and severe fire years that affected hundreds of thousands of acres, raises questions about threat predictions based on minor disturbances or temperature fluctuations.

Vertebrates and vascular plants aside, the possibility of a Survey and Manage species being extirpated from the NWFP area is a potential risk, and is a risk whether Survey and Manage is retained or not. There are, after all, eleven species on Survey and Manage with no known sites on federal lands within the area, and another 22 with only one known site. While the majority of these are probably represented outside the NWFP area as well, they may not all be. And while all may be actually extant on numerous but as yet undetected sites, it is possible one or more are actually very rare, or at least rare enough that additional habitat disturbance places them at some risk of extirpation.

At full Northwest Forest Plan implementation, timber harvest is projected as 247,000 acres of late-successional forest, or about 3 percent of late-successional forest in the NWFP area, per decade (2004 FSEIS:110-111). If a species is so rare as to exist at only one forested location, and if the occupied area is smaller than the average timber sale unit size, the risk of the harvest affecting its entire habitat is around 3 percent per decade. If it is limited to two such sites, that risk drops to less than 1/10th of 1 percent (.03 times .03, or 3 percent of 3 percent). Similarly, if there are two different such species extant on only one such site each, the likelihood of intersecting them both is less than 1/10th of 1 percent. These are worst-case scenarios. If the harvest unit only partially catches the occupied area, or if part of the occupied area falls within the required retention area for each harvest unit, the actual risk of intersecting the species is less. If there are three or more such sites, the risk is exponentially less. "Intersecting" is used here, because so far the discussion is only about exposure. Whether those intersections are significant even at the site scale depends upon susceptibility.

For negative impacts to occur, the species must also be susceptible. On most regeneration harvest timber sale units, the harvest activity would leave a certain percentage of the largest oldest trees, down logs, and snags within the harvest unit. Timber sale contracts include requirements to minimize soil disturbance. These provisions are specifically designed to retain remnants of local non-mobile organisms such as fungi and invertebrates. The level of potential negative impact, or risk, is affected by the species sensitivity to the treatment. For example, the April 17 2006 U.S. Fish and Wildlife Service's decision not to list the Siskiyou Mountains salamander cites detections in clearcut units at essentially the same rate as for uncut areas (71 *Federal Register* 23886) apparently in part because the species favors rock crevasses, so susceptibility to timber harvest activity appears to be low.

Fuel treatments are expected to take place within 270,000 to 520,000 acres of late-successional forest per decade (since about one-third of the landscape is late-successional), mostly in the dry provinces. Much of this treatment would be prescribed fire, or mechanical treatments preparing for prescribed fire. In general, these treatments are designed to protect stands and landscapes from uncharacteristically severe wildfire, and many of these treatments would take place in Late-Successional Reserves where in addition to the wildfire risk reduction objective, the fires are attempting to restore ecosystem processes. Some Survey and Manage species are susceptible to these treatments, although most species in these provinces should be adapted to some level of natural fire, albeit at different seasons. At least one mollusk species, *Helminthoglypta talmadgei*, appears to favor recently burned sites (Agee 2001). Natural fire return interval in these dry provinces is generally 0 to 35 years. The mechanical fuel treatments probably pose a bigger hazard for most species.

Most species, and arguably any species having a significant ecosystem role, would be present at more than one site. The odds that management activities over a decade (administrative units plans cover about 15 years) might noticeably affect any of the 61 species determined to be at risk under Alternative 2 was examined statistically and in detail. The examination ranged from considering a species so rare as to exist on only one site, and odds are calculated as above. Noting, however, that about 1/3 of the species had at least one detection in the approximately 750 RMS Survey plots (actual number of plots varied by taxa), the risk to population sizes down to 1/100th of a detection on these same RMS Survey plots was examined (e.g. the assumption that 75,000 ½-acre RMS Survey plots would result in a single detection). The odds that a decade of Agencies' timber harvest would intersect at least 20 percent of its population were determined. A single detection on 75,000 survey plots translates (on average) to approximately 375 occupied acres. If such a species was clustered into one area of late-successional forest in the Matrix, the odds were about 5 percent. If the species was spread into at least 5 separated clusters distributed across all land use allocations, the odds of intersecting 20 percent or more with harvest activities drops to 3 or 4 hundredths of a percent. Twenty percent was used in this analysis to represent a lower threshold for where negative impacts to very rare species might begin to cause gaps or otherwise affect population function. The likelihood of intersecting 80 or 90 percent of a species' sites is exponentially smaller (Alegria et al. 2006). And depending upon susceptibility and actual disturbance exposure, such intersection would not necessarily extirpate the species from the site.

The risk that any of the 61 species with insufficient habitat in all or a portion of their range under Alternative 2 would have 20 percent of its population intersected in a decade, using the detection estimates for those detected on the RMS Survey plots, and 1/100th of a detection for all others, was estimated. The odds are less than 5 percent that 20 percent of the population of one of the 61 would be intersected by harvest activities if none of the sites received protection under any program. The odds of intersecting an entire population under the above scenario is several orders of magnitude lower (Alegria et al. 2006). And as above, whether intersection results in extirpation at a site is a function of susceptibility and exposure.

Given that 49 of these are on one or more of the Agencies Special Status Species Programs (and 9 of those that are not are un-named mollusks), the actual odds are substantially less. Given that over half of these species are in Survey and Manage categories not requiring pre-disturbance surveys and are therefore likely to go undetected at harvest and other management activity sites, these odds of avoiding such intersections under Alternative 1 may be no better.

In the 1992 U.S. District Court decision that led in large part to FEMAT's thorough examination of all identifiable late-successional forest associated species, Judge William Dwyer rejected the Forest Service's adoption of the Interagency Scientific Committee's Northern Spotted Owl plan saying in part, the Forest Service cannot adopt a plan which they know or believe will probably cause the extirpation of other native vertebrate species in the planning area (Seattle Audubon Society, et al. v. Moseley et al., No. C92-479WC (SAS v. Moseley)). At issue were projections by some biologists that the adopted plan would provide only for a low to medium-low likelihood of providing for the viability of 32 vertebrate species specifically identified in the Forest Service's 1992 Environmental Impact Statement for Management of the Northern Spotted Owl (USDA 1993 unpub.; USDA, USDI 1994a:3&4-258).

The 1982 NFMA regulations at 36 CFR 219.19 require management of sufficient habitat to maintain viable populations of existing native and desired non-native vertebrate species in the planning area (see 2004 FSEIS:27). That is, well distributed habitat sufficient to support, at least, a minimum number of reproductive individuals and the habitat must be well distributed so those individuals can interact with each other. For the reasons discussed above, all alternatives meet this standard for the six vertebrates on Survey and Manage.

The 1982 regulation at 219.27(g) requires preservation and enhancement of plant and animal diversity so that it is at least as great as that which would be expected in a natural forest. Reductions may be prescribed only where needed to meet overall multiple-use objectives. For reasons discussed above, all alternatives appear to meet this standard. Many management activities reduce diversity temporarily and on a limited geographic scale; the regulation is clearly not intended to prohibit such perturbations. The risk to completely losing a species is very low, as described above. The risk of losing a species at all is only quantifiable for actually rare species, and that is low. That such a loss would be acceptable is not proposed here; if a species were to be actually extirpated it would be unknowingly extirpated. Nevertheless, loss of an actually rare species would not itself violate this provision. First, it is not reasonable to provide for multiple use and human activity while maintaining a risk-free environment. Second, to the degree an increase in risk is the result of a need to meet other multiple-use objectives (and that risk is recognized), the provision expressly permits it.

The BLM has no similar regulations regarding viability and diversity applicable to O&C Land Act lands.

Agencies' Special Status Species Programs and other policies require management of species to preclude listing under the Endangered Species Act. It can be assumed that additional Special Status Species Program assignments will be made if a threat is indicated. "Insufficient habitat" outcomes, for the reasons discussed for the 1982 NFMA viability and diversity provisions, do not necessarily predict a trend toward listing.

At some evolutionary scale, excessive application of the precautionary principle is not practical. There are several hundred thousand microarthropods in a square meter of temperate forest floor (Madson 2003 citing Wallwork 1970, Norton 1990). Although some species of microarthropods are identified, they are generally considered as functional groups. As life forms become smaller, subterranean, or dispersal-limited, their numbers of apparent species within taxa rises dramatically**.** Researchers estimate there are 2,000 mycorrhizal fungi species associated with Douglas-fir roots alone (Trudell et al. 2006), and while groups of these are active at different points or during different seasons, no single species is identified as irreplaceable or uniquely critical to facilitating water and nutrient uptake and other functions. Tiny mollusk species such as some on Survey and Manage can be very localized because, in drier climates, they remain restricted to habitats close to their natal area (USDA et al. 1993). A stochastic event or a management activity could extirpate them from one or more of these sites.

Given that knowledge of actually rare species is limited, that management activities affect only a small percentage of the late-successional forest each decade, that species may not be extirpated from sites by management activities, that 86 percent of the late-successional forests are in reserves, and the other factors discussed above, the risk of extirpating a species appears low and acceptable.

Bryophytes

Environmental Consequences

Brotherella roellii

(At the end of this section on page 142, insert:)

There is no significant new information about *Brotherella roellii* that would change the outcomes for any of the alternatives since the 2004 FSEIS.

***Buxbaumia viridis* (California only)**

(At the end of this section on page 142, insert:)

Two new sites have been found in California since the 2004 FSEIS. There is no other significant new information, and these new sites do not change the outcomes for this species under any alternative. Under Alternative 2 without SSSP, loss of habitat and sites would be expected to occur. Therefore, because of the low number of known sites, there is insufficient habitat and sites to support stable populations in the California portion of the NWFP area under Alternative 2 without SSSP.

Diplophyllum plicatum

(At the end of this section on page 143, insert:)

Little change has occurred in known site numbers since the 2004 FSEIS and there is no new information applicable to the management of this species. The one RMS Survey detection provides little new information about rarity or land allocation. Because, under Alternative 2, a prediction of habitat sufficient for stable populations was based on the combination of habitat and known sites in reserves and inclusion in the Oregon BLM Special Status Species Program, Alternative 2 without SSSP would likely lead to habitat (including known sites) that is insufficient to support stable populations in the NWFP area.

Herbertus aduncus

(At the end of this section on page 143, insert:)

There is no significant new information about *Herbertus aduncus* that would change the outcomes for any of the alternatives since the 2004 FSEIS. Under Alternative 2 without SSSP, there is the potential for loss of some known sites (Most of the known sites are in State or National Parks). However, there remains insufficient information to determine an outcome under Alternative 2 without SSSP.

Iwatsukiella leucotricha

(At the end of this section on page 143, insert:)

There are at least 9 sites of this species now documented on federal land as well as another 4 sites occurring on state lands in Washington and Oregon. Current information continues to indicate that this species is rare and of limited distribution. Because, under Alternative 2, a prediction of habitat sufficient for stable populations was based on the combination of habitat and known sites in reserves and inclusion in BLM and Forest Service Special Status Species Programs, Alternative 2 without SSSP would likely lead to habitat (including known sites) that is insufficient to support stable populations in the NWFP area.

Kurzia makinoana

(At the end of this section on page 144, insert:)

No new sites have been found since the 2004 FSEIS, and there is no new information indicating that the species is other than rare and of limited distribution within the NWFP area. There continues to be insufficient information for determining outcome under any alternative, including the scenario of Alternative 2 without Special Status Species Programs.

Marsupella emarginata* var. *aquatica

(At the end of this section on page 144, insert:)

There are no new sites or other new information since the 2004 FSEIS concerning the distribution or habitat requirements of this species. While the known sites of this species

occur on lands managed by the Forest Service, it was assumed in the 2004 FSEIS that this species would not be included in the Forest Service Special Status Species Program. Because of this, the predicted outcome under Alternative 2 was based on presumed protection of known sites due to their inclusion within Riparian Reserves. However, there are recent studies (Paavola et al. 2003, Muotka and Laasonen 2002) indicating that stream management directed toward habitat improvement for fish or aquatic macroinvertebrates may have negative effects on aquatic bryophytes and that key physical factors in the stream environment differ among aquatic bryophytes, fish, and aquatic macroinvertebrates. These studies suggest that management decisions affecting in-stream environments that do not include consideration of aquatic bryophytes may result in loss of aquatic bryophyte habitat and sites. This new information, coupled with knowledge that one of the two known sites of this species occur in the drainage from a lake that serves as a multiple-use recreational destination, suggests that Alternative 2 could result in habitat insufficient to support stable populations of this species in the NWFP area.

Orthodontium gracile

(At the end of this section on page 145, insert:)

There are no new known sites or other significant new information that would change the outcome for this species under any alternative.

Because the habitat is already largely protected, inclusion on the BLM Special Status Species program in California is not considered to be critical to provide for stable populations. Habitat (including known sites) is sufficient to provide for stable populations under Alternative 2 without SSSP.

***Ptilidium californicum* (California only)**

(At the end of this section on page 145, insert:)

There are numerous new known sites for this species in California. The new sites are almost evenly divided between the Six Rivers, Shasta-Trinity, and Klamath National Forests. Many of these new sites are clustered, although they also fill gaps in the distribution from 2004. Abundance of *Ptilidium californicum* is low at most recorded sites, although local concentrations of known sites indicates that it may be thinly spread over large areas in appropriate habitat. This species was detected on three plots on Region 5 California forests during the Random Multi Species (RMS) Survey project. This results in an estimated 141,600 (Standard Error (SE) = 80,800) expected 0.2 ha detections in California. It was also located on a Rogue River National Forest plot in California from a separate, independent sample population. All four of the detections occurred in late successional old growth stands in reserved land allocations. The high SE with the estimate is too high to provide a satisfactorily accurate estimation of occurrence in California. However, the RMS Survey results, together with the steadily increasing numbers of known sites from other sources suggest that the species is not uncommon in old-growth forests in reserved land allocations. Although there is potential for damage to individual known sites, even in reserves, particularly from fuels reduction projects, there are enough known sites distributed over a large enough area to provide a reasonable assurance of resiliency to the species in California within the present climatic regime. Habitat (including known sites) is sufficient to provide for stable populations under Alternative 2 without SSSP.

Racomitrium aquaticum

(At the end of this section on page 145, insert:)

At least 31 known sites, including 6 RMS Survey detections, are now documented within the NWFP area. However, a recent publication has determined that California material previously identified as this species may be neither *R. aquaticum* nor *R. ryszardii* (Norris and Shevock 2004). Statistical analysis of the 6 RMS Survey detections projects, indicates,

with 95% confidence, that some amount of this species occurs on no less than about 50,000 0.2 ha parcels within the NWFP area. The apparent contradiction between the relatively small number of known sites and the large number of projected occurrences is likely, in part, due to under-collection associated with the great difficulty in recognizing this species in the field. With the assumption that Oregon and Washington material currently identified as *R. aquaticum* represents no more than a single taxonomic entity, there now appears to be sufficient information to determine outcome for this species. Habitat is sufficient to support stable populations under all alternatives.

Rhizomnium nudum

(At the end of this section on page 146, insert:)

At least 37 known sites, all on lands managed by the Forest Service, are now documented in Oregon. Seventeen of these sites occur in reserve allocations. There were three detections of this species during RMS Survey within Oregon. Statistically based population estimates based on RMS Survey detections have not been completed for the Oregon portion of the NWFP area. Hence, biological inferences using RMS Survey data cannot be made with confidence. The majority of known sites occur on Mt. Hood and Willamette National Forests, where they are rather evenly distributed among reserve and non-reserve allocations. Because this species typically occurs in higher and moister plant communities where management actions are generally low in frequency and intensity, the species is subject to relatively low risk due to forest management activities. In addition, the Oregon RMS Survey detections of this species, along with the generally low frequency of project-related bryophyte surveys within suitable habitat, suggest that the species is likely underreported within its Oregon range. With or without inclusion in BLM or Forest Service Special Status Species Programs, habitat is sufficient to provide for stable populations of this species under all Alternatives.

Schistostega pennata

(At the end of this section on page 146, insert:)

Several new sites have been found since the 2004 FSEIS. The new sites do not expand the known range of the species. Most new sites are in the general vicinity of previously known sites although there is slightly increased distribution of known sites within the northern Washington Cascades. There is no other significant new information that would change the existing outcomes. Known occurrences are mostly small and are restricted to substrates that are temporary (i.e. the soil on the underside of upturned roots of fallen conifers). It is unknown what the population trend at these sites is or whether the sites are even still extant since this species occupies such a transitory substrate. The absence of detection of this species in the RMS Survey Analysis is consistent with a species that is rare on the landscape. The new sites do not significantly change the relative percentage of known sites in reserved land allocations. Therefore, Alternative 2 without inclusion into SSSP would result in habitat (including known sites) insufficient to support stable populations in the NWFP area.

Tetraphis geniculata

(At the end of this section on page 147, insert:)

Several new sites have been found since the 2004 FSEIS. Almost all of the new sites are on the Gifford Pinchot National Forest. This species appears to be fairly well-distributed within the appropriate habitat on this forest but nowhere else in the NWFP area. The majority of the new sites continue to occupy predominantly non-reserved land allocations. The one RMS Survey detection provides little new information about rarity or land allocation. There is no other significant new information that would change the existing outcomes. Because the known sites are concentrated within a relatively small portion of the NWFP area and there is limited protection from the reserve network, Alternative 2

without inclusion into SSSP would result in habitat (including known sites) insufficient to support stable populations in the NWFP area.

Tritomaria exsectiformis

(At the end of this section on page 147, insert:)

There is no significant new information about this species that would change the outcomes for any of the alternatives since the 2004 FSEIS. There continues to be insufficient information for determining outcome all alternatives, including the scenario of Alternative 2 without SSSP.

Tritomaria quinquedentata

(At the end of this section on page 147, insert:)

There is no significant new information about *Tritomaria quinquedentata* that would change the outcomes for any of the alternatives since the 2004 FSEIS.

Fungi

Environmental Consequences

Group 1 *refers to the group of species described starting on page 149, third paragraph, and discussed through the first paragraph on page 150. This group includes species that have not been located in the NWFP area since 1996 and have insufficient habitat under all alternatives.*

Group 2 *refers to the group of species described starting on pages 150, first full paragraph and continuing on through the first partial paragraph of page 152. This group includes species that have been located since 1996 but also have insufficient habitat under all alternatives.*

Group 3 *refers to the group of species described in the first full paragraph on page 152 and the list of species that follow it. This group includes species that have insufficient information to determine an outcome.*

Group 4 *refers to the group of species described beginning in the last paragraph on page 152, and discussed through the end of the page. This group includes species that have sufficient habitat under all alternatives.*

Group 5 *refers to the group of species described starting at the top of page 153, third paragraph and discussed through the next to last paragraph on that page. This group includes species that are not endemic to the NWFP area and that would have an outcome of sufficient habitat under Alternative 1, but insufficient habitat under Alternative 2.*

Group 6 *refers to the group of species described starting with the bottom paragraph on page 153 and discussed through the end of this section on page 154. This group includes species that are endemic to the NWFP area and that would have an outcome of sufficient habitat under Alternative 1, but insufficient habitat under Alternative 2.*

(At the end of group 1, after the first paragraph on page 150, insert:)

New information since the 2004 FSEIS corrects the genus for the following species: *Macowanites lymanensis* has been transferred to the genus *Cystangium* as *Cystangium lymanensis* (Trappe et al. 2002). *Martellia fragrans* has been transferred to the genus *Gymnomyces* as *Gymnomyces fragrans* (Trappe et al. 2002). *Martellia idahoensis* has been transferred to the genus *Cystangium* as *Cystangium idahoensis* (Trappe et al. 2002). *Octavianina papyracea* has been transferred to the genus *Zelleromyces* as *Zelleromyces papyracea* (Trappe et al. 2002).

Twenty species formerly in this group were moved to group 2 because additional specimens have been found since 1996. Three species, *Cortinarius depauperatus*, *Martellia idahoensis*, and *Pholiota albivelata* formerly in group 2 were moved to this group because they have less than 10 known sites and have not been found since institution of the Survey and Manage fungus laboratory in 1996.

For the remaining 24 species no new sites have been found since the 2004 FSEIS; there is no new information indicating that these species are other than rare or uncommon and of limited distribution within the NWFP area.

Under Alternative 2, 4 of these 27 species are assumed to be included in Agencies' Special Status Species Programs. Under the scenario of Alternative 2 without SSSP, the outcome is also habitat (including known sites) is insufficient to support stable populations across the NWFP area.

(At the end of group 2, after the first paragraph on page 152, insert:)

The following species were moved to group 2 from group 1 because additional specimens have been found since 1996.

Albatrellus avellaneus (B)
Arcangeliella crassa (B)
Baeospora myriadophylla (B)
Balsamia nigrens (B)
Boletus haematinus (B)
Cordyceps ophioglossoides (B)
Cortinarius variipes (B)
Cortinarius wiebeae (B)
Cyphellostereum laeve (B)
Elaphomyces anthracinus (B)
Fayodia bisphaerigera (B)
Fevansia aurantiaca (B)
Gymnomyces nondistincta (B)
Macowanites mollis (B)
Neolentinus adhaerens (B)
Ramaria hilaris var. olympiana (B)
Rhizopogon abietis (B)
Rhizopogon brunneiniger (B)
Rhizopogon ellipsosporus (B)
Thaxterogaster pavelekii (B)

The following species were moved to group 2 from group 3 because specimens have been found since 1996. Previous to 2002 these species were not known to exist within the NWFP area but were suspected to occur within it.

Galerina sphagnicola (E)
Ramaria lorithamnus (B)
Russula mustelina (B)
Tricholoma venenatum (B)

Sixteen species moved from group 2 to group 4, due to the discovery of new sites. Three species moved from group 2 to group 1.

No new sites have been found *for Chroogomphus loculatus*, *Elaphomyces anthracinus*, and *Thaxterogaster pavelekii* but they have been recollected from previously known sites subsequent to 1996.

For the 22 species that are on SSSP, under the scenario of Alternative 2 without SSSP, the outcome would still be habitat (including known sites) insufficient to support stable populations in the NWFP area.

(At the end of group 3, before the last full paragraph on page 152, insert:)

Four species were moved from group 3 to group 2, due to the discovery of new sites.

(At the end of group 4, at the end of page 152, insert:)

The following 16 species were moved to group 4 from group 2, based on the discovery of new sites.

Boletus pulcherrimus (B)
Clavulina castanopes v. *lignicola* (B)
Collybia racemosa (B)
Cortinarius olympianus (B)
Galerina cerina (B)
Gastroboletus ruber (B)
Gastroboletus turbinatus (B)
Gelatinodiscus flavidus (B)
Hygrophorus karstenii (B)
Mycena tenax (B)
Neolentinus kauffmanii (B)
Phellodon atratus (B)
Ramaria abietina (B)
Ramaria conjunctipes v. *sparsiramosa* (B)
Rickenella swartzii (B)
Tylopilus porphyrosporus (D)

Hygrophorus karstenii is presently known as *Hygrophorus saxatilis* (Castellano et al. 2003).

In the scenario of Alternative 2 without SSSP, *Boletus pulcherrimus*, *Collybia racemosa, Phaeocollybia olivacea* (in California and Washington) and *Phaeocollybia oregonensis* would not have known site management. Habitat under this scenario would be insufficient to provide for stable populations.

Under Alternative 1, in Oregon, *Phaeocollybia olivacea* is a Category F species, which means that it does not have known site management nor pre-disturbance surveys. Under the scenario of Alternatives 2 and 3 without SSSP, habitat would be sufficient to provide for stable populations.

In the scenario of Alternative 2 without SSSP, *Clavulina castanopes* v. *lignicola* is assumed to be included as a sensitive species in BLM California, where there are no reported sites. Habitat under this scenario would be sufficient to provide for stable populations.

(At the end of group 5, before the last paragraph on page 153, insert:)

Two species formerly in this group were moved to group 6 because they are endemic to the NWFP area.

Gomphus bonarii is a synonym *of Turbinellus floccosus* (Schwein) Earle, which is the correct name for *Gomphus floccosus* (Giachini 2004). *Gomphus floccosus* was removed from the Survey and Manage Program by the 2001 ASR. *Gomphus bonarii* is no longer considered a Survey and Manage species and is removed from further consideration in this Supplement.

Eleven of these species are assumed to be assigned to one or more Agencies' SSSP under Alternative 2. Included are all species except *Galerina heterocystis*, *Rhizopogon truncatus*, and *Tremiscus helvelloides*. Under the scenario of Alternative 2 without SSSP, these 11 species would still have an outcome of habitat (including known sites) insufficient to support stable populations.

One species, *Sparassis crispa*, is assumed to be assigned to the California BLM SSSP under Alternative 3. Under the scenario of Alternative 3 without SSSP, this species would still have an outcome of habitat (including known sites) insufficient to support stable populations.

(At the end of group 6 and the end of this section, before the last paragraph on page 153, insert:)

Cortinarius barlowensis (Castellano et. 2003) and *Phaeocollybia scatesiae* (Norvell 1998) were moved to group 6 from group 5 because they are endemic to the NWFP area.

Twenty-three of these species are assumed to be assigned to one or more Agencies' SSSP under Alternative 2. Included are all species except *Ramaria celerivirescens*. Under the

scenario of Alternative 2 without SSSP, these 23 species would still have an outcome of habitat (including known sites) insufficient to support stable populations.

Lichens

Affected Environment

Coastal Lichens

(At the end of this section near the top of page 156, insert:)

Since the 2004 FSEIS, there have been additional publications (Geiser et al. 2004, Geiser and Neitlich 2006, Glavich et al. 2005a, b, Lesher et al. 2003, Mote et al. 2003), and one report (Glavich et al. 2006) that provide evidence corroborating previous concepts of these species and expand understanding of distribution, number of populations in reserves, habitat requirements, and potential vulnerability to climate change.

Pin Lichens

(At the end of this section at the bottom of page 156, insert:)

Since the 2004 FSEIS, there has been an additional publication (Rikkenen 2003) that expands the understanding of distribution and habitat requirements for the pin lichen group.

Environmental Consequences

Bryoria pseudocapillaris

(At the end of this section on page 158, insert:)

New information for *Bryoria pseudocapillaris* since the 2004 FSEIS better document that its world distribution is limited to within 16 km of the California, Oregon and Washington coastlines (with just one, small population outside the NWFP area), that only two of fourteen populations in federal lands are in protected land allocations, that it is primarily associated with stands greater than 80 years of age, and that it is highly vulnerable to climate change (regional predictions for temperature increases by 2040 would place a majority of existing populations in temperature zones that are outside the range currently tolerated by this species (Geiser and Neitlich 2006, Glavich et al. 2005 a, b).

This information does not change the 2004 FSEIS outcome of insufficient habitat to support stable populations on federal lands for all alternatives. If *Bryoria pseudocapillaris* is not designated as, or is removed from the SSSP under Alternative 2, there would also be insufficient habitat to support stable populations in the NWFP area.

Bryoria spiralifera

(At the end of this section on page 158, insert:)

New information for *Bryoria spiralifera* since the 2004 FSEIS better document that: 1) its world distribution is limited to within 1.6 km of the California and Oregon coastlines in lodgepole pine sand dune forests (with just two small, populations outside the NWFP area along the California coast); 2) none of the 11 well-documented populations in federal lands are in reserve allocations; 3) it is primarily associated with stands greater than 80 years of age; and 4) it is potentially highly vulnerable to climate change (regional predictions for temperature increases by 2040 would place a majority of existing populations, including the most important population, in temperature zones that are outside the current range for this species (Geiser and Neitlich 2006, Glavich et al. 2005a, b)).

This information does not change the 2004 FSEIS outcome of insufficient habitat to support stable populations in the NWFP area for all alternatives. If *Bryoria spiralifera* is not designated as, or is removed from the SSSP under Alternative 2, then habitat would also be insufficient to support stable populations in the NWFP area.

Bryoria subcana

(At the end of this section on page 159, insert:)

New information for *Bryoria subcana* since the 2004 FSEIS has reduced the number of verified populations to four, all in the Oregon Coast Range and Oregon Western Cascades physiographic provinces. The lichen has not been found, so far, in Washington, and there have been no updates on the condition of historic sites just south of the NWFP area in San Mateo and Santa Clara Counties, CA since the 1970s. There are no other known sites in western North America. Because of the low number of known sites, there is still very little information about the habitat requirements of this lichen in the NWFP area. This information does not change the 2004 FSEIS outcome of insufficient habitat to support stable populations on federal lands in all alternatives.

Currently this species is only a BLM Bureau Sensitive species even though two of the four known sites are on National Forest lands and only one is on BLM land. If *Bryoria subcana* is not designated as, or is removed from SSSP under Alternative 2, habitat remains insufficient to support stable populations in the NWFP area.

Buellia oidalea

(At the end of this section on page 159, insert:)

Attempts to survey for *Buellia oidalea* since the 2004 FSEIS support previous conclusions that this lichen is very rare in the NWFP area and showed that it is impractical to survey. There is a possibility of extirpation from all or a portion of its current range within the NWFP area due to loss of habitat from management or recreational activities, land sales, private land development, invasive species, increased flooding and storm frequency, or climate change. This information does not change the 2004 FSEIS outcome of insufficient habitat to support stable populations on federal lands across all alternatives.

Calicium abietinum

(At the end of this section on page 160, insert:)

There is no significant new information about *Calicium abietinum* that would change the outcomes for any of the alternatives in since the 2004 FSEIS.

Calicium adspersum

(At the end of this section on page 160, insert:)

New information for *Calicium adspersum* since the 2004 FSEIS includes a report of the first site on federal land. The information is from the results of a proposive survey (Rikkenen 2003) conducted in high probability habitat in western Oregon. This information does not change the finding of insufficient information under all alternatives for the reasons already stated. The outcome for the scenario of Alternative 2 without SSSP is also insufficient information to determine an outcome.

Cetrelia cetrarioides

(At the end of this section on page 160, insert:)

New information for *C. cetrarioides* since the 2004 FSEIS includes the report of 24 new sites. This information does not change the 2004 outcome. Because there are comparatively few

known sites within the portion of this species' range in Washington, only about 20 percent of the known sites in the NWFP area are located in reserve allocations, and there is a concern that riparian enhancement projects have the potential to disturb habitat for species requiring riparian hardwood trees, the scenario of Alternative 2 without SSSP in Washington on Forest Service managed lands would not provide sufficient habitat to support stable populations in this portion of the NWFP area. Therefore, the outcome for this scenario is habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area.

Chaenotheca chrysocephala

(At the end of this section on page 161, insert:)

New information for *Chaenotheca chrysocephala* since the 2004 FSEIS includes 14 detections from the RMS Survey, 18 new sites reported, and information from proposive surveys. From the RMS Survey data, it is estimated that 44 percent of predicted detections on federal land would occur within reserve land allocations. Proposive surveys (Rikkenen 2003) conducted in high probability habitats in western Oregon found this species to be broadly distributed in both the Coast Range and Cascade Mountains. From this information it can be inferred that the species is well distributed within this portion of the NWFP area. Based on this new information, the species has sufficient habitat to provide for stable populations under all alternatives.

Chaenotheca ferruginea

(At the end of this section on page 161, insert:)

New information for *Chaenotheca ferruginea* since the 2004 FSEIS includes 2 detections from the RMS Survey and the addition of 98 known sites. Most of the new sites are on lands managed by the BLM in southwest Oregon and the Forest Service in the Columbia River Gorge. Proposive surveys conducted in high probability habitats in western Oregon (Rikkenen 2003) found locations of *C. ferruginea* to be well distributed in montane conifer forests in the Coast Range and Cascade Mountains, as well as the foothills of the Willamette Valley. The new sites, as well as the finding that the species is well distributed in a broad range of habitats, suggests that the species is less rare than previously thought in this portion of the NWFP area. This new information supports changing the 2004 FSEIS outcome to habitat (including known sites) is sufficient to support stable populations in the NWFP area under all alternatives.

Chaenotheca subroscida

(At the end of this section on page 161, insert:)

New information for *Chaenotheca subroscida* since the 2004 FSEIS includes 3 detections from the RMS Survey, 8 new reported sites, as well as information from proposive surveys conducted in high probability habitats in western Oregon (Rikkenen 2003). This new information does not change the 2004 FSEIS outcome. Alternative 2 without a SSSP scenario on Forest Service managed lands in Oregon and Washington would also have an outcome of insufficient habitat to support stable populations in the NWFP area.

Chaenothecopsis pusilla

(At the end of this section on page 162, insert:)

New information for *Chaenotheca pusilla* since the 2004 FSEIS includes 3 detections from the RMS Survey, 8 new sites, as well as information from proposive surveys conducted in high probability habitats in western Oregon (Rikkenen 2003). This new information does not change the 2004 FSEIS outcome of habitat insufficient to support stable populations in the NWFP area under all alternatives.

Collema nigrescens

(At the end of this section on page 162, insert:)

New information for *Collema nigrescens* since the 2004 FSEIS includes 2 detections from the RMS Survey and 9 new sites reported. This information does not change the outcome in the 2004 FSEIS. Under Alternatives 2 and 3 without SSSP in Washington on lands managed by the Forest Service, the outcome would be similar to that of Alternative 1. Therefore, there is sufficient habitat to support stable populations in the NWFP area.

Dendriscocaulon intricatulum

(At the end of this section on page 163, insert:)

New information for *Dendriscocaulon intricatulum* since the 2004 FSEIS includes 3 detections from the RMS Survey, 2 of which occurred on Forest Service managed lands in California, 103 new sites on Forest Service managed lands in California and 6 new sites in Oregon (outside of the Klamath Province) and Washington. This information does not change the 2004 FSEIS outcomes for any alternative, however habitat is now considered sufficient on Forest Service managed lands in California under Alternative 2. Under the scenario of Alternative 2 without SSSP on BLM managed lands in California and Forest Service managed lands in Washington, there would be insufficient habitat to support stable populations in this portion of the species' range.

Dermatocarpon luridum

(At the end of this section on page 164, insert:)

New information for *Dermatocarpon luridum* since the 2004 FSEIS corrects the name for this taxa to *Dermatocarpon meiophyllizum* (Glavich and Geiser 2005). Prior to a recent study of aquatic lichens in the NWFP area, *D. meiophyllizum* was known from only 9 sites in North America. Of 12 historic populations of *D. luridum* in the NWFP area that were relocated and re-identified, all proved to be *D. meiophyllizum*, not *D. luridum*. An additional 22 populations have been discovered on Forest Service and BLM lands, all *D. meiophyllizum*, equally distributed in California, Oregon and Washington in the Siskiyou, Coast, and Cascade Ranges.

This information does not change the 2004 FSEIS outcome of sufficient habitat to support stable populations on federal lands under all alternatives. Pre-project surveys and management of known sites is critical to this outcome; the scenario of Alternative 2 without SSSP would lead to habitat insufficient to support stable populations in the NWFP area.

Fuscopannaria (Pannaria) saubinetii

(At the end of this section on page 164, insert:)

There is no significant new information about *Fuscopannaria saubinetii* that would change the outcomes for any of the alternatives in the 2004 FSEIS.

Heterodermia sitchensis

(At the end of this section on page 165, insert:)

This lichen, endemic to coastal Oregon and British Columbia, is only known in the NWFP area from an old-growth Sitka spruce forest in Cape Lookout State Park, Tillamook Co., OR, the southernmost population in its world distribution. New information for *Heterodermia sitchensis* since the 2004 FSEIS provide additional evidence that this lichen is rare and is not known inland from the immediate coast. This information does not change the 2004 FSEIS determination of insufficient information to determine an outcome under all alternatives. If *Heterodermia sitchensis* is not designated as, or is removed from the BLM

SSSP in Oregon under Alternative 2, the outcome remains insufficient information to determine an outcome.

Hypogymnia duplicata

(At the end of this section on page 165, insert:)

New information for *H. duplicata* since the 2004 FSEIS includes 8 detections from the RMS Survey and 85 reported sites, most in Washington. Of the 8 RMS Survey detections, 2 were within the Oregon portion of its range, where the species is still considered rare. The RMS Survey found this species to be marginally significantly associated with late-successional forest habitat, corroborating previous notions of its habitat requirements. This information does not change the 2004 FSEIS outcomes for any alternative. Because most known sites within the Oregon portion of the species' range are within reserve land use allocations where they receive some protection, the scenario of Alternatives 2 and 3 without SSSP on Forest Service managed land in Oregon would provide sufficient habitat (including known sites) to support stable populations in the NWFP area.

Hypogymnia vittata

(At the end of this section on page 165, insert:)

There is no significant new information about *Hypogymnia vittata* that would change the outcomes for any of the alternatives in the 2004 FSEIS.

Hypotrachyna revoluta

(At the end of this section on page 166, insert:)

New information for *Hypotrachyna revoluta* since the 2004 FSEIS better documents that its Oregon Northwest Forest Plan distribution is limited to within 3.6 km of the coastline in dense, coniferous forests with a hardwood shrub component and trees that are usually less than 80 years old, while in California it occurs up to 45 km inland on oak woodlands. There are two known sites on marine beach rocks. Only 1 of the 13 verified populations in the NWFP area is in a federal reserve allocation, and Oregon populations are potentially vulnerable to climate change (regional predictions for temperature increases by 2040 would put all Oregon populations in temperature zones that are outside the current range for the habitat this species currently occupies (Geiser and Neitlich 2006, Glavich et al. 2005b). This information does not change the 2004 FSEIS estimation of insufficient habitat to support stable populations on federal lands.

If *Hypotrachyna revoluta* is not designated as, or is removed from the Forest Service SSSP in Oregon and Washington and the BLM SSSP in Oregon under Alternative 2, the outcome of insufficient habitat to support stable populations would remain.

Leptogium burnetiae var. hirsutum

(At the end of this section on page 166, insert:)

There is no new information about *Leptogium burnetiae* var. *hirsutum* that would change the outcomes for any of the alternatives in the 2004 FSEIS. Under Alternative 2 without SSSP on Forest Service managed lands in Washington and Oregon, the outcome is also insufficient information to determine an outcome for the reasons already stated.

Leptogium cyanescens

(At the end of this section on page 167, insert:)

New information for *Leptogium cyanescens* since the 2004 FSEIS includes 6 detections from the RMS Survey. This information does not change the 2004 FSEIS outcome of insufficient habitat across all alternatives. Under the scenario of Alternative 2 without SSSP on Forest

Service managed lands in Washington and Oregon, the outcome is also insufficient habitat to determine an outcome for the reasons already stated.

Leptogium rivale

(At the end of this section on page 167, insert:)

New information for *Leptogium rivale* since the 2004 FSEIS documents an additional 39 populations on Forest Service and BLM lands, mostly in Oregon, but also in California and Washington from the Siskiyou, Coast, and Cascade Ranges.

This information does not change the 2004 FSEIS outcome of sufficient habitat to support stable populations on federal lands under all alternatives.

Leptogium teretiusculum

(At the end of this section on page 167, insert:)

New information about *Leptogium teretiusculum* includes three detections from the RMS Survey and 25 new sites. This information does not change the outcomes for any of the alternatives in the 2004 FSEIS.

Lobaria linita

(At the end of this section on page 168, insert:)

New information for *Lobaria linita* since the 2004 FSEIS includes 2 detections from the RMS Survey within a portion of the range south of Snoqualmie Pass. This information does not change the outcome from the 2004 FSEIS. Because of its rarity in the southern portion of the range and the few new sites that have been found there since the 2004 FSEIS, there is insufficient habitat to support stable populations in a portion of its range under the scenario of Alternative 2 without SSSP on BLM managed lands in Washington and Oregon and Forest Service managed lands in Oregon.

Lobaria oregana

(At the end of this section on page 169, insert:)

New information for *Lobaria oregana* since the 2004 FSEIS includes 2 detections from the RMS Survey in California as well as the addition of 11 new sites within the California portion of the NWFP area. This information does not change the 2004 FSEIS outcomes. Under the scenario of Alternative 2 without SSSP on BLM managed lands in California, the outcome is also insufficient habitat to support stable populations for the reasons already stated.

Microcalicium arenarium

(At the end of this section on page 169, insert:)

New information for *Microcalicium arenarium* since the 2004 FSEIS includes the location of the first two sites on federal land. This information does not change the 2004 FSEIS outcome that there is insufficient information about this species under all alternatives. Under the scenario of Alternative 2 without SSSP on BLM managed lands in Oregon, there is insufficient information to determine an outcome for the reasons previously stated.

Nephroma bellum

(At the end of this section on page 169, insert:)

New information for *Nephroma bellum* since the 2004 FSEIS includes 12 detections from the RMS Survey within the Survey and Manage portion of its range and 9 new reported sites.

This information does not change the 2004 FSEIS outcomes of sufficient habitat to support stable populations under all alternatives. Because this species is still considered to be rare in the Olympic Peninsula Province in Washington, Alternative 2 without SSSP on Forest Service managed lands in Washington would result in insufficient habitat to support stable populations in this portion of the range. Sites in the Washington Western Cascades Province north of the Gifford Pinchot National Forest are likely to be in reserve allocations that afford them some protection. The scenario of Alternative 2 without a SSSP on BLM managed lands in California would have no effect on the species at this time because there are no known sites there. Alternative 2 without SSSP is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area.

Nephroma isidiosum

(At the end of this section on page 170, insert:)

Strategic Survey results for *Nephroma isidiosum* since the 2004 FSEIS provide additional evidence that this lichen is suspected to occur in, but so far is not known from, the NWFP area. This information does not change the 2004 FSEIS determination of insufficient information to determine an outcome under all alternatives.

Nephroma occultum

(At the end of this section on page 170, insert:)

New information for *Nephroma occultum* since the 2004 FSEIS includes 3 detections from the RMS Survey and 59 reported new sites on federal lands. This information does not change the 2004 FSEIS outcomes for any alternative. Because only about 30 percent of the total known federal sites are within reserve land allocations, Alternatives 2 and 3 without SSSP on Forest Service managed lands in Oregon and Washington could lead to the loss of some sites. This, combined with the factors already stated, results in an outcome for Alternatives 2 and 3 without SSSP of insufficient habitat to support stable populations.

Niebla cephalota

(At the end of this section on page 171, insert:)

New information for *Niebla cephalota* since the 2004 FSEIS better documents that, in the NWFP area: 1) its distribution is limited to the marine fog belt of the northern California, southern Oregon, and Puget Sound Washington coastlines (all known sites are within 4.2 km of the ocean); 2) its habitat is Sitka spruce and lodgepole pine forests of marine terraces and dune landforms with relatively few rainy days, warmer winter temperatures, and lower annual rainfall in comparison to the coastline as a whole; 3) tree age is not a useful predictor of presence or absence; 4) only five of the 29 verified populations in the NFWP area are in federal reserve allocations, (most populations are in state parks) and all known reserve sites are in California; and 5) that uncertainty exists as to whether predicted regional climate changes would have a net beneficial or adverse effect on its current and potential habitat (warmer temperatures would favor, but increased precipitation would disfavor this lichen). This information does not change the 2004 FSEIS determination of insufficient habitat to support stable populations in the NWFP area under all alternatives.

Because of the rarity and narrow range of this species, the scenario of Alternative 2 without SSSP would also result in habitat insufficient to support stable populations in the NWFP area.

Pannaria rubiginosa

(At the end of this section on page 171, insert:)

New information for *Pannaria rubiginosa* since the 2004 FSEIS includes a reduction in the number of extant populations known from the NWFP area to four locations, two on federal land, and one supporting a small population in a federally reserved land allocation. Re-examination of historic vouchers showed that many had been incorrectly identified. The largest population is on state land in Oregon. In addition to concerns caused by the low number of known sites, there is also reason to consider that the main populations are likely to be vulnerable to climate change, especially because of increases in temperature predicted by 2040 (Geiser and Neitlich 2006, Glavich et al. 2005b). For these reasons, the outcomes for all alternatives is habitat insufficient to support stable populations under Alternatives 1, 2, and 3.

Under Alternative 2, if the species is removed from SSSP in Oregon and California BLM, rarity and narrow range would also lead to insufficient habitat to support stable populations in the NWFP area.

Peltigera pacifica

(At the end of this section on page 172, insert:)

New information for *Peltigera pacifica* since the 2004 FSEIS includes 7 detections from the RMS Survey and the addition of 91 new sites on federal lands within the NWFP area. This information changes the 2004 FSEIS outcome under Alternative 2.

From RMS Survey estimates, it can be inferred that most expected detections would occur within reserve allocations. This new information, in addition to the location of 91 new sites, supports changing the 2004 FSEIS outcome to habitat is sufficient to support stable populations in the Norwest Forest Plan are under Alternative 2. This new information also supports an outcome of sufficient habitat to support stable populations under Alternative 2 without SSSP in the NWFP area.

Platismatia lacunosa

(At the end of this section on page 172, insert:)

New information for *Platismatia lacunosa* since the 2004 FSEIS includes 3 detections from the RMS Survey in the NWFP area (except the Oregon Coast Range). This information does not change the 2004 FSEIS outcomes for any alternative. Because there are relatively few known sites within the Washington portion of the species' range and concern that riparian enhancement projects have the potential to disturb habitat for species requiring riparian hardwood trees, the preferred substrate of *lacunosa*, there is insufficient habitat within a portion of the NWFP area to support stable populations under the scenario of Alternative 2 without SSSP on Forest Service managed lands in Washington.

Pseudocyphellaria perpetua

(At the end of this section on page 173, insert:)

New information for *Pseudocyphellaria perpetua* since the 2004 FSEIS indicates that the Northwest Forest Plan population locus is in the west side of the central Oregon Coast Range, and that it is rare elsewhere in Oregon and Washington where it can be expected at elevations less than 500 meters, primarily in riparian habitats in the Coast Ranges and foothills of the Western Cascade Ranges of Oregon and Washington. Seven of the 20 well-documented populations in federal lands are in reserve allocations. Temperature increases predicted by regional climate change models would put the majority of populations in temperature zones warmer than those in which the species is currently found in western North America by 2040 (Geiser and Neitlich 2006, Glavich et al. 2005b). This information

does not change the 2004 FSEIS outcome of insufficient habitat to support stable populations on federal lands across all alternatives.

Pseudocyphellaria rainierensis

(At the end of this section on page 174, insert:)

New information for *Pseudocyphellaria rainierensis* since the 2004 FSEIS includes 6 detections from the RMS Survey in the NWFP area. This information supports what was previously known about the species; that there are a moderate number of sites and it is associated with late-successional forest habitat. This information does not change the 2004 FSEIS outcomes for any alternative. Under the scenario of Alternative 2 without SSSP on Forest Service managed lands in Oregon and Washington, there is also insufficient habitat to support populations for the reasons already stated under Alternative 2.

Stenocybe clavata

(At the end of this section on page 174, insert:)

New information for *Stenocybe clavata* since the 2004 FSEIS includes 4 detections from the RMS Survey, and 3 detections during proposive surveys conducted in high probability habitats in western Oregon (Rikkenen 2003). Because of the low number of known sites and large standard error of the estimate of detections from the RMS Survey, this new information does not change the 2004 FSEIS outcome that there is insufficient information to determine and outcome under all alternatives.

Teloschistes flavicans

(At the end of this section on page 175, insert:)

New information sources for *Teloschistes flavicans* since the 2004 FSEIS provide additional evidence that there is only one large population in the NWFP area, at Cape Lookout State Park in Tillamook Co., Oregon. Only a few individuals have been found at the ten other known sites, half of which are in federal reserve land allocations. The lichen has not been found, so far, in Washington. All known sites are within a few kilometers of the Pacific Ocean. This information does not change the 2004 FSEIS determination of insufficient habitat to support stable populations in the NWFP area.

If *Teloschistes flavicans* is not designated as, or is removed from SSSP under Alternative 2, rarity and narrow range indicates habitat would still be insufficient to support stable populations in the NWFP area.

Tholurna dissimilis

(At the end of this section on page 175, insert:)

New information about *Tholurna dissimilis* since the 2004 FSEIS includes the discovery of a site in the upper canopy of a Douglas-fir tree at relatively low elevation. Previous habitat information only included windswept trees at higher elevations. This new information does not change the 2004 FSEIS outcomes for any alternative. Because there are still only a few known sites within the Oregon portion of its range, the parameters of the species' habitat and distribution cannot yet be determined. Under the scenario of Alternative 2 without SSSP on BLM and Forest Service managed lands in Oregon, there is insufficient information to determine an outcome.

Usnea hesperina

(At the end of this section on page 176, insert:)

New information for *Usnea hesperina* since the 2004 FSEIS better documents that its NWFP area distribution is limited to the marine fog belt within 15 km of the California, Oregon,

and Washington coastlines to the northwest tip of the Olympic Peninsula, in western hemlock forests. There is suggestive evidence, based on randomly selected survey sites, that the lichen is primarily associated with forests in which the dominant trees are greater than 80 years of age (Glavich et al. 2005a). Fourteen of the 27 well-documented populations in federal lands are in reserve allocations, but odds ratio tests based on results from randomly selected survey sites did not provide evidence that the majority of the NWFP area populations are in reserve land allocations (Glavich et al. 2005a). The lichen is not uncommon in the Olympic National Seashore, but can still be considered rare elsewhere within its coastal habitat and it would be vulnerable to climate changes that affect the marine fog belt. This information does not change the 2004 FSEIS estimation of insufficient habitat to support stable populations on federal lands.

Usnea longissima

(At the end of this section on page 176, insert:)

New information for *Usnea longissima* since the 2004 FSEIS includes 11 detections from the RMS Survey within the Oregon Coast Range Province, and 2 detections from the Oregon Cascades. From this new information, it can be inferred that *Usnea longissima* is not rare in the Coast Range Province. This new information does not change the 2004 FSEIS outcomes for any alternative. Because there were no RMS Survey detections in the Category A portion of its range, where there are still a comparatively low number of known sites, an inference can be made that the species is rare there. Alternative 2 without SSSP for Forest Service managed lands in Curry, Josephine, and Jackson Counties, Oregon and BLM and Forest Service managed lands in California, could lead to a loss of sites and an outcome of insufficient habitat to support populations. Within the remainder of the species' range in Oregon and Washington there is sufficient habitat to support stable populations without SSSP on Forest Service managed lands. Overall, for the scenario of Alternative 2 without SSSP, habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area.

Vascular Plants

Environmental Consequences

Arceuthobium tsugense ssp. mertensianae

(At the end of this section on page 178, insert:)

There is no new information about *Arceuthobium tsugense ssp. mertensianae* since the 2004 FSEIS.

Bensoniella oregana

(At the end of this section on page 179, insert:)

There is no new information about this species that would change outcomes for each alternative in the 2004 FSEIS. Because the California portion of the species' range is represented by only two known sites that are separated by 110 miles from the more numerous Oregon populations, habitat would be insufficient to provide for stable populations under the scenario of Alternative 2 without SSSP on BLM and Forest Service managed lands in California.

Botrychium minganense* and *Botrychium montanum

(At the end of this section on page 179, insert:)

New information for these species includes the report of 2 new sites for *Botrychium minganense* and 39 new sites for *Botrychium montanum*. This new information would not change the outcomes for any alternative in the 2004 FSEIS.

Because of the low number of known sites for *Botrychium minganens*, 60 percent of which are in the Matrix, there would be insufficient habitat to support stable populations under the scenario of Alternative 2 without SSSP on Forest Service managed lands in Oregon and California.

Because 68 percent of *Botrychium montanum* known sites are within reserve allocations, there would be sufficient habitat to support stable populations under the scenario of Alternative 2 without SSSP on Forest Service managed lands in Oregon and California and BLM managed lands in Oregon.

Coptis asplenifolia* and *Coptis trifolia

(At the end of this section on page 180, insert:)

New information for these species includes one new site reported for *Coptis trifolia* and nine new sites for *Coptis asplenifolia*. This new information does not change the outcomes for any of the alternatives in the 2004 FSEIS.

Known *Coptis asplenifolia* sites all occur within reserve land use allocations where they are afforded some protection. Under the scenario of Alternative 2 without SSSP on Forest Service managed lands in Washington, there would be sufficient habitat to provide for stable populations of *Coptis asplenifolia*.

Coptis trifolia is still known from a very small number of sites that need active management to maintain stable populations. Under the scenario of Alternative 2 without SSSP, there would be insufficient habitat to provide for stable populations on BLM and Forest Service managed lands in Oregon and Washington.

Corydalis aquae-gelidae

(At the end of this section on page 180, insert:)

New information for *Corydalis aquae-gelidae* since the 2004 FSEIS includes the location of 57 new sites, further characterization of habitat requirements for the species and a monitoring plan for a hydroelectric project area (PGE 2006). Because 84 percent of the new reported sites occur within proximity to areas that were known to have *C. aquae-gelidae* populations (Scott, J. pers. comm.; Ruchty, A. pers. comm.), the new sites are considered to be part of existing populations. An investigation to further define the habitat requirements of this species determined that *C. aquae-gelidae* in the Clackamas River drainage in Oregon occurs on stream reaches that have a mean gradient of 3-4 percent, and are downstream of structures or land features that either moderated flows or diverted flows away from plants (McShane 2003). Determining these narrow habitat requirements may help to explain why the species has a patchy distribution pattern. This new information would not change the outcomes for any of the alternatives in the 2004 FSEIS.

Because the largest concentrations of *C. aquae-gelidae* in Oregon occur within river reaches used by two hydroelectric projects, they are potentially vulnerable to inundation and dewatering. Fish habitat improvement and thinning projects also have the potential to adversely impact sites. For these reasons, Alternative 2 without SSSP on BLM and Forest Service managed lands in Oregon and Washington would not provide sufficient habitat to support stable populations.

Cypripedium fasciculatum

(At the end of this section on page 181, insert:)

New information for *Cypripdium fasciculatum* since the 2004 FSEIS includes the addition of 374 sites on federal lands within the NWFP area (excluding the Eastern Washington Cascades Province). This information does not change the 2004 FSEIS outcomes for any alternative. Despite the large number of new sites reported, the total number of plant stems these sites represent is disproportionately low. Seventy-two percent of all known sites in the NWFP area have fewer than 10 stems per site and essentially all (96%) have fewer than 50 stems per site (USDA, USDI 2005a). In addition, 84 percent of known sites occur within the Matrix, where management activities that result in the reduction of canopy cover or disturb the soil and duff layer could result in the decline the site. Under the scenario of Alternatives 2 and 3 without SSSP on BLM and Forest Service managed lands in California, Oregon and Washington, there would be insufficient habitat to support stable populations throughout the NWFP area.

Cypripedium montanum

(At the end of this section on page 181, insert:)

New information for *Cypripdium montanum* since the 2004 FSEIS includes the addition of 255 known sites on federal lands within the NWFP area (excluding the Eastern Washington Cascades Province). This information does not change the 2004 FSEIS outcomes for any alternative. Because long-term monitoring of sites in northern California have indicated declining population trends (USDA 2005a) and the majority of known sites are within Matrix, under the scenarios of Alternatives 2 and 3 without SSSP on BLM and Forest Service managed lands in California there would be insufficient habitat to support stable populations throughout the NWFP area.

Eucephalus vialis

(At the end of this section on page 182, insert:)

New information since the 2004 FSEIS includes the report of 79 new known sites and completion of a Conservation Assessment (USDA, USDI 2005b). This information does not change 2004 FSEIS outcome for any alternative. Concerns for this species persistence, due to habitat fragmentation and management activities including road construction and maintenance; plantation forestry where young stands approach 100 percent canopy closure; and excessive ground disturbance where mineral soil is disturbed. Invasive plant competition is also seen as a threat to known sites (Sawtelle, N. pers. comm.). Preliminary genetics work indicates that populations may be susceptible to the loss of genes, or random genetic drift, because of fragmented habitat and because the species is an obligate out-crosser. Subsequent generations of crossing among low numbers of related breeding individuals could result in inbreeding depression (USDA, USDI 2005b). Because of these concerns, and because only 3 percent of known sites are within reserve land allocations, there would be insufficient habitat to support stable populations under the scenario of Alternative 2 without SSSP on BLM and Forest Service managed lands in Oregon.

Galium kamtschaticum

(At the end of this section on page 182, insert:)

New information for *Galium kamtschaticum* since the 2004 FSEIS includes the report of 4 new known sites on federal land. This new information would not change the outcomes for any of the alternatives in the 2004 FSEIS. Because all known *Galium kamtschaticum* sites are within reserve allocations, there is sufficient habitat to support stable populations within the NWFP area under the scenario of Alternative 2 without SSSP on Forest Service

managed lands in the Olympic Peninsula and Eastern Washington Cascades Province and Western Washington Cascades Provinces south of Snoqualmie Pass.

Platanthera orbiculata* var. *orbiculata

(At the end of this section on page 182, insert:)

New information for *Platanthera orbiculata* var. *orbiculata* since the 2004 FSEIS includes one detection from the RMS Survey and the report of 68 new sites on federal lands. There is no significant new information about *Platanthera orbiculata* var. *orbiculata* that would change the outcomes for any of the alternatives in the 2004 FSEIS.

Mollusks

Environmental Consequences

Cryptomastix devia, Cryptomastix hendersoni, Hemphillia burringtoni, Hemphillia glandulosa* (WA Western Cascades), *Hemphillia malonei* (in Washington), *Lyogyrus* n. sp. 1, *Monadenia fidelis minor*, *Oreohelix* n. sp., *Pristiloma arcticum crateris*, *Prophysaon coeruleum* (in Washington and California), *Trilobopsis roperi,* and *Vespericola shasta

(After the second full paragraph on page 187, insert:)

There is no significant new information that would change the effects described in the 2004 FSEIS for *Cryptomastix devia, Cryptomastix hendersoni, Hemphillia burringtoni, Lyogyrus* n. sp. 1, *Monadenia fidelis minor*, *Oreohelix* n. sp., *Pristiloma arcticum crateris*, *Trilobopsis roperi,* and *Vespericola shasta*. Under the scenario of Alternative 2 without SSSP, these species would not have managed sites. Because of the low number of individuals and limited distribution of these species, the resultant loss of sites could result in habitat insufficient to support stable populations. Due to lack of species-specific management under the scenario of Alternative 2 without SSSP, habitat (including known sites) is insufficient to support stable populations in the NWFP area.

Since the 2004 FSEIS there is significant new information for *Hemphillia glandulosa* including detections at 11 RMS Survey plots (of which 8 are within reserves) and new known sites in Washington. Within the Washington Cascade Province, populations are adjacent to, and assumed to be in, reserve networks, which offers protection to *Hemphillia glandulosa.* Therefore, under the scenario of Alternative 2 without SSSP, *Hemphillia glandulosa* (in WA Western Cascades Province), habitat (including known sites) is sufficient to support stable populations in the NWFP area.

Since the 2004 FSEIS there is significant new information for *Hemphillia malonei* including detections at nine RMS Survey plots (of which 7 are within reserves) and new known sites in Washington, which nearly doubles the number of known sites in 2004. These new findings indicate the species is not as uncommon, and is better distributed than previously thought. Populations are adjacent to, and assumed to be in, reserve networks offering protection to *Hemphillia malonei*. Therefore, under the scenario of Alternatives 2 and 3 without SSSP, *Hemphillia malonei* in Washington has habitat (including known sites) sufficient to support stable populations in the NWFP area.

Since the 2004 FSEIS there is significant new information for *Prophysaon coeruleum,* including detections at 26 RMS Survey plots, of which 22 are within in reserves. The species was previously removed from Survey and Manage in Oregon because of the extensive number of detections there. Washington and California have over 100 known sites depicting the edge of the Oregon population. Detections are adjacent to, and assumed to be in, reserve networks offering protection. Therefore, under the scenario of Alternative

2 without SSSP, *Prophysaon coeruleum* (in Washington and California) habitat (including known sites) is sufficient to support stable populations in the NWFP area.

Deroceras hesperium*, *Fluminicola* n. sp. 3 and 11, *Hemphillia pantherina*, *Juga* (*O*) n. sp. 2, *Lyogyrus* n. sp. 2, *Monadenia troglodytes troglodytes*, *Monadenia troglodytes wintu*, *Trilobopsis tehamana*, *Vertigo* n. sp., and *Vespericola pressleyi

(After the last paragraph on page 188, insert:)

For other than *Hemphillia panterina,* there is no significant new information that would change the effects described in the 2004 FSEIS for all alternatives. For *Hemphillia pantherina*, surveys conducted at and in the vicinity of the single historic site have resulted in negative detections. If extant, analysis of the one historic site in riparian habitat does not provide sufficient information to determine an outcome for any alternative including the scenario of Alternative 2 without SSSP.

Under the scenario of Alternative 2 without SSSP, *Deroceras hesperium, Trilobopsis tehamana, Vespericola pressleyi, Monadenia troglodytes troglodytes, Monadenia troglodytes wintu,* and *Vertigo n. sp.* and the four aquatic species *Fluminicola* n. sp. 3 and 11, *Juga* (*O*) n. sp. 2, and *Lyogyrus* n. sp. 2 would not have managed sites. Rarity, limited distributions, and narrow ranges of these species could mean that the loss of sites could result in habitat insufficient to support stable populations. Due to lack of species-specific management under the scenario of Alternative 2 without SSSP, habitat (including known sites) is insufficient to support stable populations in the NWFP area.

Helminthoglypta talmadgei* and *Monadenia chaceana

(After the first paragraph on page 190, insert:)

Since the 2004 FSEIS there is significant new information for *Helminthoglypta talmadgei,* including over one hundred new known sites and a new publication (Dunk et al. 2004). This provides evidence that species habitat is not limited to late-successional forests, but is also closely associated with early seral forests (particularly Quercus hardwood forests) and is found frequently on more recently burned plots. This information changes the effects described in the 2004 FSEIS under Alternatives 2 and 3. Habitat (including known sites) is sufficient to support stable populations in the NWFP area.

Under the scenario of Alternatives 2 and 3 without SSSP, *Helminthoglypta talmadgei* (in California) would no longer be managed on BLM lands. There are only two known sites on BLM lands but this appears to be a function of limited survey efforts. In addition, these two sites are located near the National Forest and represent a continuous population. Therefore, even without SSSP, there is little risk to the population. Under the scenario of Alternatives 2 and 3 without SSSP, habitat (including known sites) is sufficient to support stable populations in the NWFP area.

(After the second paragraph on page 190, insert:)

Since the 2004 FSEIS there has been an increase in number of sites, nearly doubling those known in 2004, which expands the moderately large range, and increases the known site abundance within known populations. Negative detections from surveys, in and around the range, confirm the species is unpredictable in its distribution and there is insufficient information to define habitats critical to this species. This does not change the outcomes described in the 2004 FSEIS for *Monadenia chaceana*. Under the scenario of Alternative 2 without SSSP, *Monadenia chaceana* would not have managed sites. The resultant loss of sites could result in habitat insufficient to support stable populations. Due to lack of species-specific management, under the scenario of Alternative 2 without SSSP, habitat (including known sites) is insufficient to support stable populations in the NWFP area.

Fluminicola seminalis

(After the last full paragraph on page 191, insert:)

There is no significant new information that would change the effects described in the 2004 FSEIS. Under the scenario of Alternative 2 without SSSP, *Fluminicola seminalis* would not have managed sites. The rarity and narrow range of this species could mean that the loss of sites could result in habitat insufficient to support stable populations. Due to lack of species-specific management under the scenario of Alternative 2 without SSSP, habitat (including known sites) is insufficient to support stable populations in the NWFP area.

***Fluminicola* n. sp. 14, 15, 16, 17, 18, 19, and 20; *Juga* (*O*) n. sp. 3; *Lyogyrus* n. sp. 3; and *Vorticifex* n. sp. 1**

(After the last full paragraph on page 192, insert:)

New information since the 2004 FSEIS includes the description of *Fluminicola* n. sp. 14 as *Fluminicola potemicus* (Hershler et al. in press)

There is no significant new information since the 2004 FSEIS that would change the outcomes for these 10 species under any of the alternatives.

Amphibians

Affected Environment

(At the bottom of page 194, insert:)

These four salamander species' habitat associations with older forest stands or stand conditions suggest loss of these habitat conditions could adversely affect them (Blaustein et al. 1995). For example, disturbances such as regeneration timber harvest or stand replacement fires, which significantly remove canopy and/or disturb substrates likely affect these salamanders. These vegetation or ground disturbances likely affect thermal and hydrological regimes and ground interstitial spaces, with concurrent effects on salamander summer/winter refugia, foraging, dispersal, and reproduction. Site occupancy or relative abundance could be affected. This conceptual model is an empirical information gap because there are no specific studies of these disturbance treatments on the salamanders considered here. However, some retrospective surveys and site monitoring supports these contentions. For example, Herrington and Larsen (1985) reported no Larch Mountain salamanders at a cut over site while they occurred at an adjacent intact area, and Clayton et al. (2005) reported loss of the Siskiyou Mountains salamander from a site for several years following clearcut harvest. Several studies on congeners demonstrate adverse effects of timber harvest activities (Clayton et al. 2005). In contrast, other reports document salamander occurrences in disturbed areas, hence, there is some uncertainty regarding these disturbance effects. There may be context-dependent effects, for example with spatial habitat heterogeneity ameliorating effects in some areas (e.g., northerly aspects, deep talus slopes, high precipitation area) and magnifying effects elsewhere (south-facing slopes, compacted soils, rainshadow).

Shasta Salamander *(Hydromantes shastae)*

(At the end of this section, on page 195, insert:)

There are 63 known sites of Shasta salamanders on federally managed lands. Some of the 56 sites reported in the 2004 FSEIS are now recognized to be "observations" of individual salamanders; these are now consolidated into fewer "sites" which represent areas of habitat contiguous with an individual salamander location, and likely include many salamanders in a sub-population. Seventy percent of federal sites (44 of 63) occur in

reserved land allocations, and 19 of 63 (30%) federal sites occur in Matrix. Since the 2004 FSEIS, 26 new federal sites have been compiled, 41% of the total known at this time. Divergent genetic lineages have been detected in this species, with genetic levels of diversification analogous to those used to recognize other plethodontid salamander species (Bingham 2004, 2006). However, at this time the Shasta salamander is considered a species-complex with multiple discrete populations. Distribution of these discrete populations within federal land allocations is not available.

Van Dyke's Salamander *(Plethodon vandykei)*

(At the end of this section, on page 195, insert:)

There are 31 known sites of Van Dyke's salamanders on federally managed lands in the Cascades. Five of the 23 sites reported in the 2004 FSEIS are now recognized to be "observations" of individual salamanders; these are now consolidated into fewer (18) "sites." About 65% of federal sites occur in reserves, and 11 of 31 (35%) federal sites are in Matrix or Adaptive Management Areas. Since the 2004 FSEIS, 13 new federal sites have been compiled, 42% of the current total.

Larch Mountain Salamander *(Plethodon larselli)*

(At the end of this section, on page 195, insert:)

There are 103 known sites of Larch Mountain salamanders on federally managed lands. About 70% of federal sites occur in reserves, with 30 of 103 (29%) in Matrix or Adaptive Management Areas. Since the 2004 FSEIS, 15 new federal sites have been compiled. Known sites occur to an elevation of 4,200 feet (Krupka et al. 2006).

Siskiyou Mountains Salamander *(Plethodon stormi)*

(At the end of this section, on page 196, insert:)

There are 367 total federal known sites of Siskiyou Mountains salamanders including 201 (55% of total) new federal sites compiled since the 2004 FSEIS, many of which were detected during pre-disturbance surveys for mollusks, or strategic surveys for salamanders. The high number of recent sites may be explained by the use of different site definitions by different surveyors; sites identified by mollusk surveys may indicate locations of individual salamanders (Reilly, E. pers. comm.), whereas sites identified by amphibian surveys are based on the polygon of contiguous habitat within which an individual was found and may include >1 individual salamander's location (Clayton et al. 2005). Only 47 sites were known in 1993, just 13% of the current number. Rocky substrate, tree species and lower elevations were associated with salamander occurrence in a recent landscape-scale habitat model for this species north of the Siskiyou crest (Suzuki et al. 2006).

The ecology and biological diversity of this animal appears to differ north and south of the Siskiyou Mountain crest near the Oregon-California border. Consequently, the range for this species has been split at the Siskiyou crest for management considerations into the north group and the south group. On federal lands, north of the crest there are 318 known sites and south of the Siskiyou crest there are 49 known sites. In the north, only 43 of 318 (13.5%) known federal sites are in reserves, with 273 of 318 (86%) occurring in Adaptive Management Areas or Matrix. A landscape-level habitat model and habitat suitability map developed for the north group shows patchy occurrence of habitat for salamanders across the northern landscape, with clusters of sites in these modeled habitat patches (Suzuki et al. 2006). In the south, 21 of 49 (43%) known federal sites occur in Matrix, and 28 of 49 (57%) occur in federal reserves. A probability sampling effort conducted south of the Siskiyou crest addressed estimated occupancy at randomly selected grid cells (0.4 x 0.4 km) across federal reserves and non-reserves at lower elevations (Nauman and Olson 2006). There was an equitable estimated occupancy rate between the two land allocations (reserves: 409

± 153 [SE] occupied grid cells; non-reserves: 443 ± 136 [SE] occupied grid cells). However, there were significantly fewer captures at grid cells in reserves than non-reserves, likely due to the distribution of non-reserves in the wetter portion of the landscape (i.e., likely optimal habitat). Hence, this infers there is an estimated lower abundance (salamanders per area) across reserved federal lands.

Genetically distinct populations have been identified (Mahoney 2003, DeGross 2004, Mead et al. 2005). The species is comprised of two discrete genetic lineages, one of which occurs across the range of the north group and into part of the south group, along its central and eastern area south of the Siskiyou crest, and a second lineage which occurs only along the south and western portion of the south group (DeGross et al. 2006). Occurrences of these two populations in the south group appear to fall in both federal reserve and non-reserve land allocations, but estimates of number of sites or proportion of range per population occurring in each type of federal land allocation is not available at this time.

At the southernmost extent of the species range, genetic and morphological analyses have revealed another distinct population that is a completely separate lineage now recognized as a new species (Scott Bar salamander, *Plethodon asupak*; Mead et al. 2005, Mead 2006). In the 2004 FSEIS, this population was considered together with the Siskiyou Mountains salamander, and it is similarly included here. At the time of the 2004 FSEIS, there were only 3 known sites that had been genetically confirmed as this new lineage. Recent sampling has raised this number to 17 locations that are genetically confirmed as *Plethodon asupak* (Mead 2006). Of these 17 sites, 14 occur on federal lands, with 3 (21% of federal sites) occurring on reserve and 11 (79%) on non-reserve land allocations. This species has one of the smallest ranges for a plethodontid salamander in North America (Mead 2006), extending about 20 km (12 mile) along its north-south axis and about 17 km (10 mile), east-to-west.

Environmental Consequences

(Before the Shasta Salamander section, on page 196, insert:)

New information does not change the outcome from the 2004 FSEIS, although they are restated here to clarify that "gaps" were intended by the effects writer to mean :portion of the range"

Shasta Salamander

(At the end of this section, on page 197, insert:)

Since 1971, the State of California has listed this species as State Threatened which offers additional oversight and protections for this salamander on federal, state and private lands. A Memorandum of Understanding with the State of California is required for collecting this species, and incidental take permits are reviewed for projects within its range or priority habitat areas. In addition, a "Comprehensive Species Management Plan" is maintained by the Shasta-Trinity National Forest (Bogener and Brouha 1979). The Comprehensive Species Management Plan includes maintaining known sites and populations. Although the comprehensive plan includes an adaptive management provision, it does not include a specified process to fill information gaps (e.g., discrete population boundaries, species range, habitat associations), and it has not been periodically revised as originally envisioned. The outdated habitat definition and survey procedures included in the comprehensive plan create some uncertainty in predicting environmental consequences. The State Threatened status and National Forest Comprehensive Species Management Plan are independent of all alternatives and SSSP scenarios considered here.

Under Alternative 1, habitat (including known sites) is sufficient to support stable populations in the NWFP area. Under Alternative 3, habitat (including known sites) is sufficient to support stable populations in the NWFP area range-wide, although there is

insufficient habitat to support stable populations in a portion of the NWFP area. Due to inadvertent loss of sites in non-late successional and old-growth forest, there are likely to be site losses and hence potential gaps in distribution and consequent potential loss of discrete populations on federal lands in the NWFP area, although their extent is uncertain.

Under Alternative 2, the Shasta salamander would have habitat (including known sites) sufficient to support stable populations range-wide in the NWFP area, although there is likely to be insufficient habitat to support stable populations in a portion of the NWFP area. In particular, there is potential loss of discrete genetic populations in the NWFP area under Alternative 2.

Under Alternative 2 without SSSP, the Shasta salamander would still be managed under the Shasta-Trinity National Forest "Comprehensive Species Management Plan." As described above, this Plan maintains known sites and populations, although there is some uncertainty in predicting environmental consequences due to its outdated habitat definition and survey procedures. In addition, this species' occurrence on federal reserved land allocations should be considered. At present, 19 of 63 (30%) federal known sites occur on non-reserved land and 44 of 63 (70%) federal sites occur in Administratively Withdrawn or Late-Successional Reserve allocations. This suggests most federal sites would not be at risk of disturbance or loss because of land management activities in non-reserves, which have priorities for other resource values such as wood production. However, it is unknown how discrete populations align with federal land allocations, and it is possible that clustered Matrix lands central to the species range (Nauman and Olson 1999) are coincident with one or more of these discrete lineages. In addition, the effects on these salamanders or their habitats of fuels treatments to reduce fire risk are not known, and these treatments may occur in reserves. In particular, this species uses small pieces of down wood on the forest floor as cover (Olson and Lewendal 1999), and loss of these microhabitats is a concern. Yet severe fire also could affect such downed wood as well as canopy closure. Alternative 2 without SSSP would maintain stable, well-distributed Shasta salamander populations that are currently known and identified in the future through new surveys conducted under the Comprehensive Species Management Plan or research. Such a scenario could have some limits that may result in inadvertent loss of undetected sites and populations, and gaps in distribution.

Under Alternative 2 without SSSP, the Shasta salamander would have habitat (including known sites) sufficient to support most stable populations range-wide in the NWFP area, although there would be insufficient habitat to support stable populations in a portion of the NWFP area. Potential gaps in distribution could result in loss of discrete genetic populations in the NWFP area under this scenario.

Van Dyke's Salamander

(At the end of this section, on page 198, insert:)

Under Alternative 1, habitat (including known sites) is sufficient to support stable populations in the NWFP area. Under Alternative 3, habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area. Due to inadvertent loss of sites in non-late successional and old-growth forest, gaps in distribution are likely, although their extent is uncertain.

Under Alternative 2, due to inclusion in the Sensitive Species Program and benefits provided by the Riparian Reserves, the Van Dyke's salamander would have habitat (including known sites) sufficient to support stable populations range-wide in the Cascade Range in the NWFP area, although there would be insufficient habitat to support stable populations in a portion of the NWFP area. Discretionary surveys and management are likely to lead to some site losses and hence gaps in distribution, however the extent is uncertain. Such gaps could be greater than those developing under Alternative 3 due to

the discretionary nature of surveys in all habitat types, not just lack of surveys in younger stands.

Under Alternative 2 without assignment as Forest Service Sensitive in Washington, the reserved land allocations of the Northwest Forest Plan would afford the Van Dyke's salamander some protection. At present, 20 of 31 (65%) federal known sites in the Cascade Range occur on reserved land allocations. This suggests over half of the known sites are likely at reduced risk from land management activities such as timber production. However, these salamanders may be vulnerable to site-specific losses from some management activities that occur on federal reserved lands. Of those sites on federal non-reserved lands (11 sites), it is currently unknown how many of them fall within Riparian Reserves or other locations likely to remain undisturbed. However, due to the primary habitats of this salamander to include seeps and stream side areas, many are likely to fall within Riparian Reserves. Hence, while there is some uncertainty regarding the maintenance of all of these sites, many could be protected from anthropogenic disturbance. However, with only 31 known sites on federal lands, this is one of the rarest vertebrates on federal lands in the region. Alternative 2 without SSSP has limited mechanisms to improve knowledge of this species' distribution, and few additional sites could be found unless independent studies were conducted. Risk to persistence could be reduced if additional sites were known. Current sites are often small, isolated, fragmented habitat patches and may be subject to natural disturbances, effects of global climate change or stochastic processes affecting their persistence. Hence, additional site losses and hence gaps in the species' distribution are likely to accrue over time, although their extent is uncertain.

Alternative 2 without SSSP likely would maintain some stable Van Dyke's salamander populations on federal lands, but with insufficient habitat to support stable populations in a portion of the NWFP area. Potential gaps in species distribution are likely to be coincident with both federal reserved and non-reserved land allocations.

Larch Mountain Salamander

(At the end of this section, on page 199, insert:)

Habitat (including known sites) is sufficient to support stable populations in the NWFP area under Alternative 1. Under Alternative 3, habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, but with insufficient habitat to support stable populations in a portion of the NWFP area. Site losses and hence gaps in distribution are likely if only older forests are surveyed, however the extent of such gaps are uncertain.

Under Alternative 2, due to inclusion in the Special Status Species Programs and the extent of federally managed sites and potential range in reserve land allocations, the Larch Mountain salamander would have habitat (including known sites) sufficient to support range-wide stable populations in the NWFP area, but with insufficient habitat to support stable populations in a portion of the NWFP area. Inadvertent loss of sites and hence gaps in distribution are likely with discretionary surveys and management.

Under Alternative 2 without SSSP, the federal reserved land allocations of the Northwest Forest Plan would afford the Larch Mountain salamander some protection. At present, 73 of 103 (71%) federal known sites occur on reserved land allocations. The spatial patterns of both sites and reserves across the species' range are patchy. Scattered sites are coincident with intermixed large blocks of federally reserved and non-reserved land. North of the Columbia River Gorge, past survey efforts have revealed that suitable habitat appears to be patchy in distribution and occupancy rates of apparently suitable habitat appears to be low. In addition, these salamanders may be vulnerable to site-specific losses from some management activities that occur on federal reserved lands. Of those sites on federal non-reserved lands (30 sites, 29% of total), management activities may compromise their persistence and it is unknown how many of these sites fall within locations likely to remain

undisturbed. This is not a riparian-associated species, hence Riparian Reserves would benefit them only if such areas transected their occupied upslope. Also, some sites are small, isolated, fragmented habitat patches and may be subject to natural disturbances, effects of global climate change or stochastic processes affecting their persistence.

Alternative 2 without SSSP would maintain some stable Larch Mountain salamander populations on federal lands range-wide in the NWFP area, although there likely is insufficient habitat to support stable populations in a portion of the NWFP area. In particular, areas north of the Columbia River Gorge, which covers the largest extent of the species' range, may be vulnerable to losses.

Siskiyou Mountains Salamander

(At the end of this section, on page 200, insert:)

Under Alternative 1, habitat (including known sites) is sufficient to support stable populations in the NWFP area, for both the northern and southern ranges. Under Alternative 3 for Siskiyou Mountains salamander in the south range, habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area. With two genetic subunits in the south group, in addition to the population now known as the Scott Bar salamander, there is a particular concern in the south for site-specific losses that may affect genetic population stability. While it has been estimated that there are about 800 occupied grid cells in the south, it is unknown how those are apportioned between the genetic populations. In addition to anthropogenic disturbances, natural disturbances, effects of global climate change or stochastic processes may affect their persistence.

Under Alternative 2 for the north and south groups, and under Alternative 3 for the north group, the Siskiyou Mountains salamander would have habitat (including known sites) sufficient to support stable populations range-wide in the NWFP area, although there would be insufficient habitat to support stable populations in a portion of the NWFP area. In particular, the Scott Bar salamander population in the south may be particularly vulnerable to gaps within its tiny range. There are only 3 (21%) known sites occurring on federal reserved lands, and 11 sites on non-reserved federal lands, hence both management activities and natural disturbances are concerns for these few localities. The Agencies' Special Status Species Programs would help provide a reasonable assurance of maintaining stable, well-distributed populations if occupied sites were managed for site persistence, and in the south, surveys to detect occupied areas and delineation of genetic populations were conducted.

Under Alternative 2 without SSSP (north and south groups) and Alternative 3 without SSSP (north group only), the Siskiyou Mountains salamander likely would benefit by reserved land allocations of the federal Northwest Forest Plan. However, for the northern range, north of the Siskiyou crest, 84% of known sites occur on federal non-reserved lands. Federal reserved lands are clustered towards the southern boundary of this north group at the Siskiyou crest. It is likely that higher elevation areas, coincident with these reserves, do not provide optimal habitat for this species (Suzuki et al. 2006). Additionally, this species may be vulnerable to some land management practices on federal reserved lands, and to natural disturbances on this landscape such as fire, both of which may result in site-specific losses. In addition, global climate change and stochastic processes may affect this species on any land allocation. Of those sites on federal non-reserved lands, it is currently unknown as to how many of them fall within locations likely to remain undisturbed. Incidental benefits to this species would occur as owl, botanical, riparian or other set-asides transect salamander-occupied habitats. However the extent of this overlap and whether such patches would protect salamander populations are uncertain. On non-reserved federal lands, while the negative effects on this species of land management activities is a particular concern, natural disturbances also may affect site-level species persistence.

Hence, there is uncertainty regarding the maintenance of sites on non-reserved lands. For the southern range, federal reserved lands are in greater proportion and about 400 occupied 0.4 x 0.4 km grid cells in reserves are estimated. However, abundance of salamanders in reserve grid cells is estimated to be lower than in non-reserves. Also, it is unknown how reserves are apportioned between the two genetic populations of this species south of the Siskiyou crest. Hence there is uncertainty regarding potential losses specific to these populations. Again, for the Scott Bar salamander population, only 3 (21%) known sites occur on federal reserved lands, and 11 sites on non-reserved federal lands, hence both management activities and natural disturbances are concerns for these few localities.

In the north range, Alternative 2 without SSSP and Alternative 3 without SSSP likely would maintain some stable Siskiyou Mountains salamander populations on federal lands of the NWFP area, although there would be insufficient habitat to support stable populations in a portion of the NWFP area. In particular, potential gaps can be expected to occur coincident primarily with federal non-reserved land allocations, which currently have 84% of sites. However, over longer time scales, it is likely that there would be both anthropogenic and natural events compromising the persistence of Siskiyou Mountains salamanders at sites in the north range across its reference distribution, and more significant gaps could develop in the NWFP area.

Under Alternative 2 without SSSP in the south range of this species, site-specific losses may affect genetic population stability but there are estimated to be sufficient sites in reserves to maintain species-level persistence. Consequently, Alternative 2 without SSSP likely would maintain some stable Siskiyou Mountains salamander populations on federal lands of the NWFP area in the south range, although there would be insufficient habitat to support stable populations in a portion of the NWFP area, including the Scott Bar population. Potential gaps on federal lands may be coincident with non-reserves or reserves due to anthropogenic and natural disturbances, effects of global climate change and stochastic processes.

Decision on Petition to List Siskiyou Mountains and Scott Bar Salamanders

On April 17, the U.S. Fish and Wildlife Service announced a 90-day finding on a petition to list the Siskiyou Mountains and Scott Bar salamanders as threatened or endangered under the Endangered Species Act. The Service found that the petition and additional information available did not indicate listing was warranted.

The *Federal Register* notice of the decision (71 *Federal Register* 23886) discussed five listing factors, including the fact that both species were being included in management under the current Survey and Manage Standards and Guidelines, and that the Siskiyou Mountains salamander was listed as a threatened species under the California Endangered Species Act. The finding noted, however, the BLM and Forest Service were proposing to remove Survey and Manage protections and were expected to make a decision by March 31, 2007. The finding also noted that the California Department of Fish and Game had submitted a petition to de-list, and a decision on that petition is expected at the California Fish and Game Commission's next meeting January 31, 2007. In regard to both of these actions, the finding states that if either action takes place, the adequacy of remaining protections should be evaluated at that time.

There were other factors discussed in the decision not to list, such as the persistence of the salamanders within timber harvest units. It is not at all clear from the findings that removal of the Survey and Manage Standards and Guidelines would necessarily lead to federal listing.

Great Gray Owl

Environmental Consequences

(At the end of this section, on page 203, insert:)

There is no significant new information available for great gray owls. Based on the information available now, the distribution of great gray owls within the NWFP area is considered to be similar to that known at the time of the original Northwest Forest Plan analysis. While there are sightings throughout the NWFP area dating back to 1967, incidental observations of great gray owls are not considered sites. There has been no significant documented change in the area where great gray owls breed within the NWFP area since the 1993 Northwest Forest Plan analysis.

The best available science continues to support the Northwest Forest Plan conclusion that the continued persistence of this species relies on the ability to find and protect available nest sites during management activities (Bull and Henjum 1990). Hayward (1994) stated that "The loss of nesting habitat in central and eastern Oregon has been identified as the most immediate threat to great gray owl persistence in that region. Therefore, determined management of nesting habitat should be a priority, without which local persistence of the species will be in jeopardy." Surveys are needed to document the location where protection is needed (Bull and Henjum 1990, Wahl pers. comm., Blow pers. comm.). As stated in the 2004 analysis, all Northwest Forest Plan alternatives (some of which did not have specific great gray owl known site management) had a high likelihood of providing habitat of sufficient quality, distribution, and abundance to allow great gray owl populations to stabilize with significant gaps in the historic distribution across federally managed land. FEMAT viability panels rated Alternative 9 as having an 83 percent likelihood of stabilizing populations of great gray owl across its range in the NWFP area. Alternative 9 included Protection Buffer standards requiring surveys and known site management.

There is no change from 2004 FSEIS Alternatives 1 and 3 outcome determinations because surveys and manage known sites are included. However, the 2004 FSEIS Alternative 2 conclusion of 'sufficient habitat under all alternatives' followed the logic that SSSP pre-project clearances and known site management would provide added benefit to 'close' the gaps noted in the Northwest Forest Plan analysis. All of the known sites for great gray owl are in Oregon, and yet the SSSP assumption applies only to Washington and California. The 2004 outcome of sufficient habitat appears to be the result of a logic error, and the FEMAT conclusion of "stabilize with significant gaps…" still applies. The outcome for Alternative 2 should be "habitat (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area."

For Alternative 2 without SSSP, the result is that same as Alternative 2 because under Alternative 2, no SSSP assumption applies in Oregon where known owl sites currently occur. Habitat, (including known sites) is sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area.

Oregon Red Tree Vole (*Arborimus longicaudus*)

Affected Environment

(After the second paragraph in this section, at the bottom of page 204, insert:)

Considerable new information has been obtained on the tree vole since 2004 FSEIS analysis, including: (1) publication of a new paper on population structure (Miller et al.

2006); (2) a thesis on home ranges, movements, and survival of tree voles (Swingle 2005); and (3) additional information on tree vole distribution and abundance from pre-project surveys, Random Double Sample (RDS) Surveys, and retrospective surveys (GeoBOB/ISMS database, Forsman and Swingle unpub). Also, two papers cited as "in preparation" in the 2004 FSEIS have been fully analyzed and published, including a publication on the taxonomic relationships of tree voles and their relatives (Bellinger et al. 2004), and a publication on the range limits and relative abundance of the red tree vole in different regions (Forsman et al. 2004). Since the 2004 FSEIS, recently active tree vole nests have been confirmed at 252 new sites in the Northern Mesic and Xeric Zones, including 222 sites reported in the GeoBOB/ISMS data base, and 30 sites documented by Forsman and Swingle (unpub) during studies of tree vole ecology or distribution (Figure 3&4-4.1S).

Although the results of the RDS survey suggest that tree vole nests are more abundant in old forests than in young forests, Swingle (2005) cautioned against the blanket assumption that young forests are always unsuitable habitat for tree voles. A number of researchers have found relatively high densities of tree voles in some young forests (Clifton 1960, Maser 1966, Swingle 2005), and some pre-project surveys also found considerable numbers of tree vole nests in young forests. Thus, unqualified statements that young forests are always unsuitable habitat for red tree voles (Aubry et al. 1991) are not consistently supported by the data.

(After the first paragraph on page 206, insert:)

Additional surveys conducted or analyzed after the 2004 FSEIS indicate that tree voles do not occur in part of the Xeric Zone, and are unevenly distributed and relatively uncommon in the rest of the zone, where they occur only in Josephine County and in a narrow zone along the western and northern edges of Jackson County (Figure 3&4-4.2S). South of Grants Pass in Oregon, the eastern range limit is the Applegate River. North of Grants Pass the eastern range limit runs ENE on a line paralleling the Jackson County line to a few miles east of Prospect, and then NNE on a line paralleling Hwy 230, about 5 miles east of the highway (Figure 3&4-4.2S). In California, Zentner (1977) located tree vole nests at three locations at the eastern edge of the Xeric Zone, but all other surveys conducted to date have indicated that tree voles are either absent or extremely rare in much of this region (Figure 3&4-4.2S). It is unclear if the locations reported by Zentner (1977) represent red tree voles or Sonoma tree voles (*Arborimus pomo*), as the range limits of the two species are still poorly documented in northern California (Bellinger et al. 2005). More surveys are needed along the eastern edge of the range limits in the Xeric Zone in both Oregon and California to better elucidate the limits of the range.

A new study of radio-collared tree voles was completed in 2005 (Swingle 2005). This study confirmed previous speculation that tree voles have relatively small home ranges, are relatively weak dispersers, and use interconnected limbs to travel from tree-to-tree in the forest canopy. There was no evidence that any of the radio-collared voles used terrestrial nests, although they did occasionally move between trees by traveling on the ground. Swingle (2005) suggested that thinning in young stands could remove the types of trees that are used by tree voles for nesting. He also suggested that some young forests may provide important habitat for tree voles, and should not necessarily be considered unsuitable habitat.

Miller et al. (2006) examined population structure in the red tree vole and found a genetic discontinuity between tree voles in northern and southern Oregon, and a slightly weaker genetic discontinuity between tree voles on opposite sides of the Willamette Valley. These discontinuities reflect a non-random distribution of genetic haplotypes in the population. The line separating the north-south discontinuity occurs near the southern end of the Willamette Valley, and may represent a zone of secondary contact between populations that were isolated during the last ice age about 12,000 years ago. Further work is needed to determine if any of these discontinuities are sufficient to warrant sub-specific status.

Bellinger et al. (2005) also cautioned that more work was needed to further evaluate subspecific and specific taxonomic relationships in the red tree vole.

(At the end of this section, near the middle of page 206, insert:)

Additional pre-project surveys, RDS surveys and retrospective surveys completed or made available since the 2004 FSEIS continue to indicate that tree voles are uncommon or absent in much of the northern Mesic Zone (USDA and USDI 1999, GeoBOB/ISMS database, Forsman et al. 2004, Swingle and Forsman unpub). For example, Random Double Species (RDS) Surveys conducted on the Salem District of the BLM and Mt. Hood National Forest revealed evidence of recently occupied tree vole nests at only 7% and 8% of the locations surveyed, respectively. In this region, there are only 170 sites with detections of recently occupied tree vole nests, most of which are concentrated in the western Cascades south of Salem (Figure 3&4-4.1S). Data from owl pellets also suggest that tree voles are uncommon in the northern Coast Ranges and northern Cascades of Oregon (Forsman et al. 2004) but the sample from this study was based on known owl territories as opposed to a random sample, and included data collected over a 33 year time span (1970-2003). The known range of the tree vole has been better documented since the 2004 FSEIS based on recent surveys in the Columbia Gorge (Forsman et al. unpub) and an analysis of tree vole occurrence in diets of spotted owls (Forsman et al. 2004). The new surveys in the Columbia Gorge demonstrate that tree voles occur at least as far east in the gorge as Mitchell Point, about 2 miles west of Hood River. This represents an eastward range extension of 10 miles from any previously known locations in the gorge.

Although (Moeur et al. 2005) found that the amount of older forest on federal lands within the area of the Northwest Forest Plan increased by about 1.9% per year in the period 1994-2003, that change was mainly due to increases in the area of forest at the lower end of the diameter range used to define old forest (i.e., relatively young forests on old burned areas or harvest units). Whether this ingrowth is the ecological equivalent of the very old forests that were cut or burned during the same time interval is unclear, at least in terms of the effects on tree voles. Moeur et al. (2005) also reported that connectivity between patches of old forest was "strong" on federal lands within the range of the tree vole. This is certainly encouraging from the standpoint of a weak disperser like the tree vole. However, it does not necessarily equate with a high probability of tree vole persistence on federal lands, especially in areas like the northern Coast Ranges and foothills of the Northern Cascades where federal lands are uncommon and often isolated in small patches.

Environmental Consequences

(Delete the fifth paragraph on page 206)

Summary and Mitigation

(Delete the first paragraph in this section on page 208, and insert:)

The new information reviewed herein suggests that tree voles are also uncommon on Federal lands in the northern Cascades of Oregon and are uncommon and irregularly distributed in the Xeric Zone of southwest Oregon and northern California, but that pre-disturbance surveys and management of known sites would allow these populations to stabilize. Thus under Alternative 1, habitat (including known sites) is sufficient to support stable populations in the Xeric Zone and the north Cascades portion of the Northern Mesic Zone.

Under Alternatives 2 and 3, there are no protections for tree voles on non-federal lands, and without management of known sites on Federal lands there is no reason to believe that tree vole populations would stabilize. Thus, under Alternatives 2 and 3, habitat (including known sites) is insufficient to support stable populations in the Xeric Zone and the north Cascades portion of the Northern Mesic Zone.

Alternative 2 without SSSP and Alternative 3 without SSSP would only affect the North Coast portion of the Northern Mesic, since that is the only area assumed affected by the SSSP. Under this scenario the outcome for this area would be the same as for Alternatives 1 through 3, habitat (including known sites) is insufficient to support stable populations.

(Delete the third paragraph in this section on page 208, and insert:)

Under Alternatives 2 and 3, with the inclusion of Riparian Reserve Scenario 1, the rating for the red tree vole was improved by an undetermined amount above 73 percent likelihood of sufficient habitat to provide for stable, well-distributed populations across federally managed lands and a 0 percent likelihood of extirpation in the NWFP area. In addition, the red tree vole is included in the Agencies' Special Status Species Programs in the northern Coast Range of Oregon under both alternatives. Habitat (including known sites) is sufficient to support stable populations range-wide in the Mesic Zone (outside of the Survey and Manage area), but is insufficient to support stable populations in the Xeric Zone and the northern Cascades and north coast portions of the Northern Mesic Zone.

(At the end of this section at the bottom of page 208, insert:)

The lack of clarity regarding both the distribution and taxonomy of the tree vole in the southern end of the Xeric Zone in California needs to be resolved. This is not likely to happen without a combination of additional pre-project surveys and a survey that systematically examines areas at the eastern edge of the range, including the areas where Zentner (1977) found evidence of tree voles. If these steps are taken, and no voles are found in the area east of the recent tree vole locations, then the range line could be reevaluated within just a few years.

Figure 3&4-4.1S. Red Tree Vole Surveys in the Northern Mesic Biological Zone.
Symbols indicate presence or absence of vole nests at locations surveyed during project clearance surveys (circles) and RDS Surveys (squares) in 1995-2006.

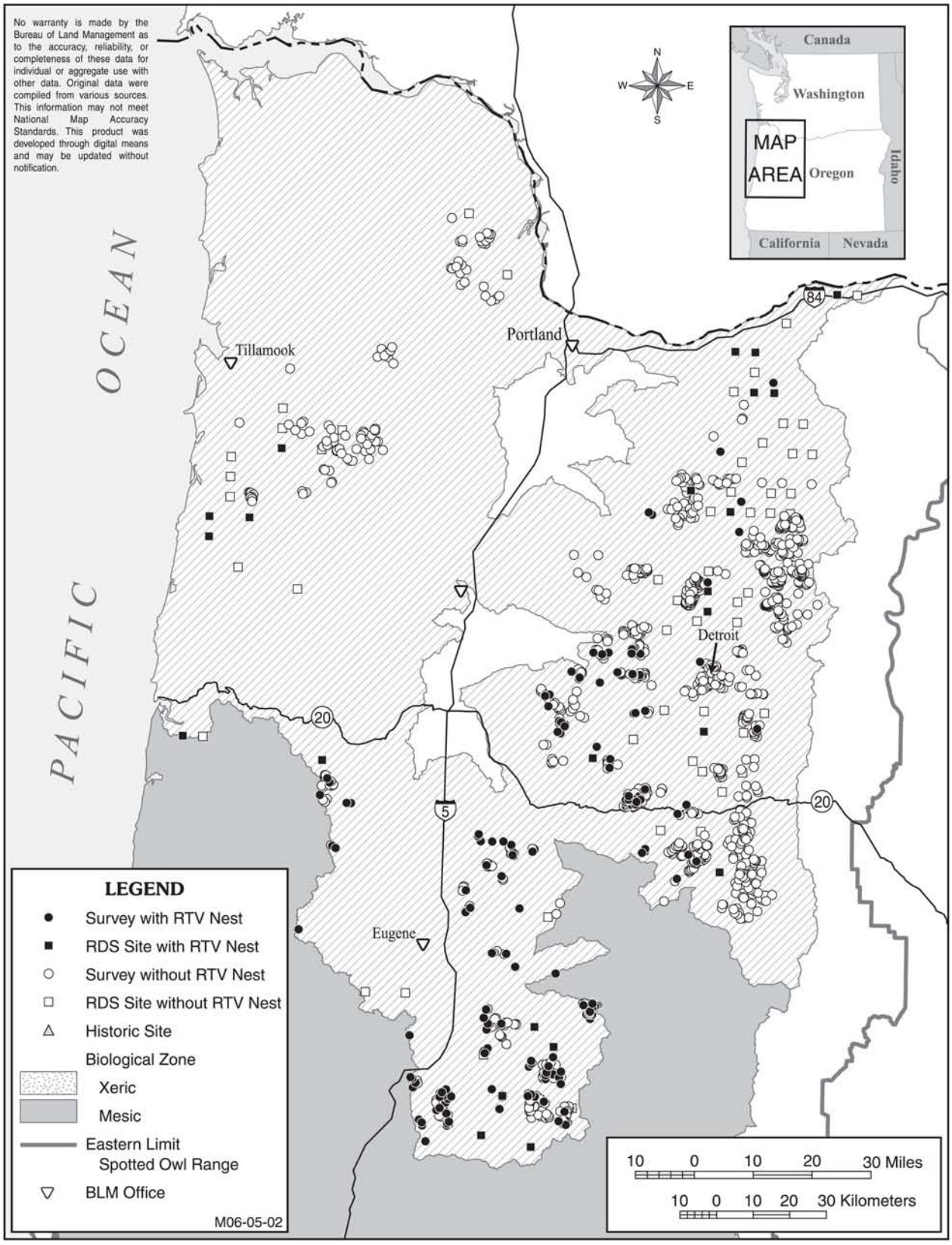
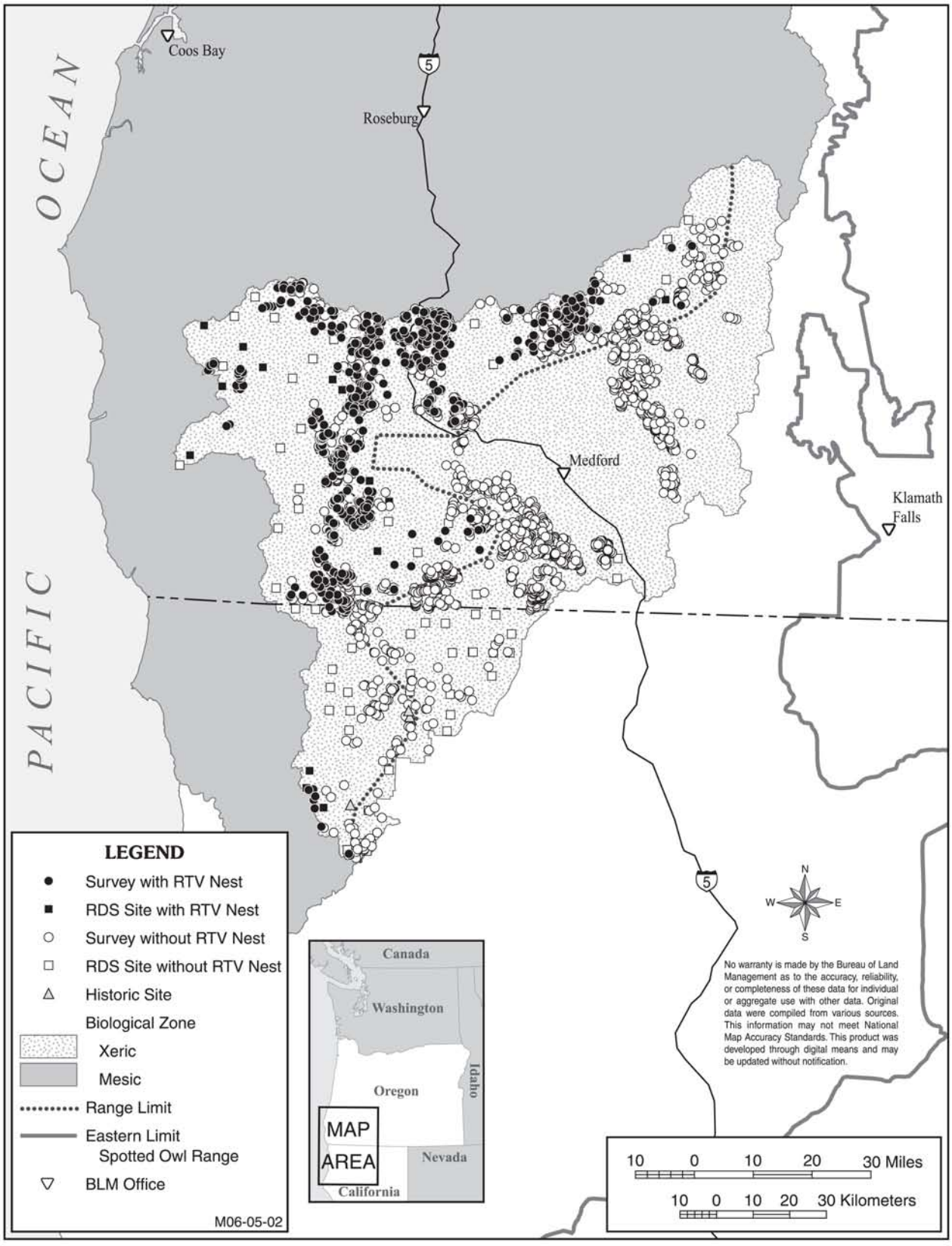


Figure 3&4-4.2S. Red Tree Vole Surveys in the Xeric Biological Zone.

Symbols indicate presence or absence of vole nests at locations surveyed during project clearance surveys (circles) and RDS Surveys (squares), 1995-2006. Approximate range limits of the tree vole in the Xeric Zone in California reflect uncertainty regarding persistence of voles at historic sites reported by Zentner (1977) (triangles) as well as uncertainty regarding species taxonomy in this region.



Costs of Management

Comparison of Alternatives

Alternative 1

(Replace the two paragraphs in this section on page 216 with:)

Alternative 1 would cost approximately $27.0 million per year to implement. This cost is less than predicted in 2000 because actual program management and strategic survey costs from Fiscal Year 2003 were used. These costs have had a downward trend over the past 3 years. This estimated cost also reflects a savings accomplished by the removal of some species from Survey and Manage and elimination of requirements to conduct pre-disturbance surveys for some species through the Annual Species Reviews. There were increased costs in pre-disturbance surveys compared to the 2000 Survey and Manage Final SEIS because acres thinned through the timber program are no longer considered complete fuel reduction projects which adds 50,000 acres per year to the fuel treatment program. The total cost of Alternative 1 includes $5.8 million for pre-disturbance surveys for timber; $12.3 million for pre-disturbance surveys for fuel treatment (based on the 160,000 acres per year predicted annual program); $0.3 million for pre-disturbance surveys for other activities; $1.5 million for additional fuel treatment cost; and $7.1 million for Strategic Surveys, program management, training, data management, and other costs. Totals are not exact due to rounding. Pre-disturbance surveys costs are estimated at $69.86 per acre, and total cost per treated acre is $94.53. Long-term (6-10 years) costs would decline by approximately 35 percent as strategic surveys are completed and recommendations are made for management of high-priority sites.

Alternative 2

(Replace the first paragraph in this section on page 216 with:)

Alternative 2 would cost approximately $10.5 million per year without mitigation and $11.0 per year with mitigation to implement. The total cost of Alternative 2 includes $2.6 million for pre-project surveys for timber; $5.3 million for pre-project surveys for fuel treatments (based on the 160,000 acres per year predicted annual program); $0.1 million for pre-project surveys for other activities; $0.5 million for additional fuel treatment cost; and $1.9 million for general surveys, program management, conservation strategies, training, data management, and other costs. Pre-project surveys would cost approximately $30.39 per acre, and total cost per treated acre is $37.55. As with Alternative 1, costs may decline over time as information is gained on the species in the Special Status Species Programs. It is estimated that 5 percent savings would accrue over time as knowledge is gained about species.

(Replace the last sentence in this section on page 218 with:)

The cost of possible mitigation under Alternative 2 for species would be $0.7 million.

Alternative 3

(Replace the first paragraph in this section on page 218 with:)

Alternative 3 would cost approximately $12.4 million per year without mitigation and $12.5 per year with mitigation to implement. The total cost of Alternative 3 includes $1.9 million for pre-disturbance surveys for timber; $3.7 million for pre-disturbance surveys for fuel treatments (based on the 160,000 acres per year predicted annual program); $0.2 million for pre-disturbance surveys for other activities; $0.7 million for additional fuel treatment cost; $5.9 million for general surveys, program management, training, data management, and other costs. Pre-disturbance surveys would cost approximately $63.43 per acre, and total cost per treated acre is $28.61. Costs may decline over time as

information is gained on the species in the Special Status Species Programs. It is estimated that 13 percent savings would accrue over time as knowledge is gained about species.

(Replace the last sentence in this section on page 219 with:)

The cost of possible mitigation under Alternative 3 is $0.1 million.

(*Replace Table 3&4-5 on page 219 with:)*

Table 3&4-5S. Annual Cost (In millions of dollars[3]).

Cost Element (includes overhead)	Alternative 1	Alternative 2	Alternative 3
Pre-disturbance surveys for Timber	5.8	2.6	1.9
Pre-disturbance surveys for Fuel Treatments	12.3	5.3	3.7
Pre-disturbance surveys for Other	0.3	0.1	0.2
Pre-disturbance surveys total	18.7	8.1	5.9
Additional Fuel Treatment Cost	1.5	0.5	0.7
Strategic Surveys / General Surveys / Program Management / Training / Data Management / Other Costs	7.1	1.9	5.9
Total Annual Cost (short term)	27.0	10.5	12.4
Total Annual Cost with Mitigation (short term)	-	11.1	12.5
Long-term Annual Cost (10 years)	17.6	10.0	10.8
Long-term Annual Cost with mitigation (10 years)	-	10.4	10.9

Totals are not exact due to rounding.

[3] 2003 Oregon Employment Department wage rates have been retained for comparison with the 2004 FSEIS being supplemented. Actual wages have increased approximately 4 percent per year, which does not change the relative differences between the Alternatives.

Socioeconomic Effects

Environmental Consequences

Lumber and Wood Products Employment and **Survey-Related Employment**

(On page 231, replace the table referenced in these two sections with:)

Table 3&4-7S. Comparison of Annual Employment and Personal Earnings[3].

Alternative 1:	
953 Lumber/Wood-related jobs lost @ $15.61/hr[2]	-$30,942,957
557 Survey-related jobs gained @ $10.91/hr	$12,639,314
Net loss in personal earnings	-$18,303,643
Alternative 2:	
318 Lumber/Wood-related jobs lost @ $15.61/hr[2]	-$10,325,078
216 Survey-related jobs gained @ $10.91/hr	$4,909,226
Net loss in personal earnings	-$5,415,852
Alternative 2 Mitigated:	
336 Lumber/Wood-related jobs lost @ $15.61/hr[2]	-$10,909,584
226 Survey-related jobs gained @ $10.91/hr	$5,129,455
Net loss in personal earnings	-$5,780,129
Alternative 3:	
409 Lumber/Wood-related jobs lost @ $15.61/hr[2]	-$13,279,821
256 Survey-related jobs gained @ $10.91/hr	$5,818,261
Net loss in personal earnings	-$7,461,560
Alternative 3 Mitigated:	
445 Lumber/Wood-related jobs lost @ $15.61/hr[2]	-$14,448,705
258 Survey-related jobs gained @ $10.91/hr	$5,854,507
Net loss in personal earnings	-$8,594,198

[1] Some jobs may be seasonal in nature, data has been annualized and figures are based on a 2,080-hour work year.

[2] Loss in jobs and earnings are in comparison to full Northwest Forest Plan harvest level (805 MMBF).

[3] 2003 Oregon Employment Department wage rates have been retained for comparison with the 2004 FSEIS being supplemented. Actual wages have increased approximately 4 percent per year, which does not change the relative differences between the Alternatives.

Table 3&4-8S. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, January 2004 FSEIS, New Sites Present (March 2006), and Random Multi-Species (RMS) Survey Sites.

TAXA GROUP *Species* — Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	Category	Known Sites in Final SEIS 2004*		New Sites Since the 2004 FSEIS**		RMS Sites
		Federal Land Only	Total	Federal Land Only	Total	
FUNGI						
Acanthophysium farlowii (Aleurodiscus farlowii)	B	1	2	-	-	-
Albatrellus avellaneus	B	1	3	4	4	-
Albatrellus caeruleoporus	B	4	9	1	1	1
Albatrellus ellisii	B	39	41	7	7	-
Albatrellus flettii, In Washington and California	B	39	43	1	1	1
Alpova alexsmithii	B	6	6	-	-	-
Alpova olivaceotinctus	B	1	1	1	2	1
Arcangeliella camphorata (*Arcangeliella* sp. nov. #Trappe 12382; *Arcangeliella* sp. nov. #Trappe 12359)	B	8	11	2	2	2
Arcangeliella crassa	B	2	2	1	1	1
Arcangeliella lactarioides	B	3	3	1	1	1
Asterophora lycoperdoides	B	1	5	3	3	1
Asterophora parasitica	B	1	5	-	-	-
Baeospora myriadophylla	B	9	17	1	1	-
Balsamia nigrens (Balsamia nigra)	B	1	4	1	1	-
Boletus haematinus	B	1	1	8	8	-
Boletus pulcherrimus	B	6	12	15	15	-
Bondarzewia mesenterica (Bondarzewia montana), In WA and CA	B	22	23	4	4	-
Bridgeoporus nobilissimus (Oxyporus nobilissimus)	A	48	60	49	63	-
Cantharellus subalbidus, In Washington and California	D	53	68	20	20	11
Catathelasma ventricosa	B	6	15	1	1	-
Chalciporus piperatus (*Boletus piperatus*)	D	43	76	9	10	-
Chamonixia caespitosa (*Chamonixia pacifica* sp. nov. #Trappe #12768)	B	3	5	4	4	3
Choiromyces alveolatus	B	7	8	1	1	1
Choiromyces venosus	B	2	2	-	-	-
Chroogomphus loculatus	B	4	4	-	-	-
Chrysomphalina grossula	B	9	14	3	3	2
Clavariadelphus ligula	B	41	47	8	8	4
Clavariadelphus occidentalis (*Clavariadelphus pistillaris*)	B	57	70	19	20	9
Clavariadelphus sachalinensis	B	29	34	1	1	-
Clavariadelphus subfastigiatus	B	5	5	3	3	-
Clavariadelphus truncatus (syn. *Clavariadelphus borealis*)	D	106	118	15	15	2
Clavulina castanopes v. *lignicola* (*Clavulina ornatipes*)	B	4	11	16	16	13
Clitocybe senilis	B	5	5	4	4	3
Clitocybe subditopoda	B	2	4	3	3	3
Collybia bakerensis	F	124	129	3	3	3
Collybia racemosa	B	17	34	10	10	4
Cordyceps ophioglossoides	B	9	12	1	1	1
Cortinarius barlowensis (syn. *Cortinarius azureus*)	B	0	0	26	26	17
Cortinarius boulderensis	B	8	9	7	7	7
Cortinarius cyanites	B	1	1	7	7	2
Cortinarius depauperatus (*Cortinarius spilomeus*)	B	1	1	-	-	-
Cortinarius magnivelatus	B	8	8	1	1	-
Cortinarius olympianus	B	41	42	8	8	5
Cortinarius speciosissimus (Cortinarius rainierensis)	B	5	5	-	-	-
Cortinarius tabularis	B	0	0	-	-	-
Cortinarius umidicola (Cortinarius canabarba)	B	1	1	-	-	-
Cortinarius valgus	B	0	0	1	1	-
Cortinarius variipes	B	4	5	1	1	1
Cortinarius verrucisporus	B	7	8	1	1	-
Cortinarius wiebeae	B	1	1	1	1	1

Table 3&4-8S. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, January 2004 FSEIS, New Sites Present (March 2006), and Random Multi-Species (RMS) Survey Sites.

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		Federal Land Only	Total	Federal Land Only	Total	
FUNGI						
Cudonia monticola	B	12	12	14	15	6
Cyphellostereum laeve	B	3	3	3	3	2
Dermocybe humboldtensis	B	1	3	1	1	-
Destuntzia fusca	B	1	3	-	-	-
Destuntzia rubra	B	0	4	-	-	-
Dichostereum boreale (Dichostereum granulosum)	B	1	1	-	-	-
Elaphomyces anthracinus	B	1	1	-	-	-
Elaphomyces subviscidus	B	1	1	1	1	1
Endogone acrogena	B	3	3	-	-	-
Endogone oregonensis	B	3	7	-	-	-
Entoloma nitidum (Rhodocybe nitida)	B	6	7	2	2	2
Fayodia bisphaerigera (Fayodia gracilipes)	B	10	14	3	3	-
Fevansia aurantiaca (Alpova sp. nov. # Trappe 1966) (*Alpova aurantiaca*)	B	2	2	-	-	-
Galerina cerina	B	3	3	13	13	13
Galerina heterocystis	E	3	7	24	25	18
Galerina sphagnicola	E	0	0	1	1	1
Gastroboletus imbellus	B	1	1	-	-	-
Gastroboletus ruber	B	25	25	2	2	1
Gastroboletus subalpinus	B	29	30	2	2	-
Gastroboletus turbinatus	B	3	4	25	26	-
Gastroboletus vividus (*Gastroboletus* sp. nov. #Trappe 2897; *Gastroboletus* sp. nov. #Trappe 7515)	B	3	3	-	-	-
Gastrosuillus amaranthii (*Gastrosuillus* sp. nov. #Trappe 9608)	E	0	0	-	-	-
Gastrosuillus umbrinus (*Gastroboletus* sp. nov. #Trappe 7516)	B	1	1	-	-	-
Gautieria magnicellaris	B	2	2	-	-	-
Gautieria otthii	B	1	2	-	-	-
Gelatinodiscus flavidus	B	19	19	38	38	-
Glomus radiatum	B	2	3	-	-	-
~~*Gomphus bonarii*~~						
Gomphus clavatus	F	71	96	34	34	11
Gomphus kauffmanii	E	43	54	14	14	2
Gymnomyces abietis (*Gymnomyces* sp. nov. #Trappe 1690, 1706, 1710; *Gymnomyces* sp. nov. #Trappe 4703, 5576; *Gymnomyces* sp. nov. #Trappe 5052; *Gymnomyces* sp. nov. #Trappe 7545; *Martellia* sp. nov. #Trappe 1700; *Martellia* sp. nov. #Trappe 311; *Martellia* sp. nov. #Trappe 5903)	B	21	21	-	-	-
Gymnomyces nondistincta (*Martellia* sp. nov. #Trappe 649)	B	1	1	-	-	-
Gymnopilus punctifolius, In California	B	0	5	4	5	-
Gyromitra californica	B	22	22	17	17	4
Hebeloma olympianum (Hebeloma olympiana)	B	6	6	-	-	-
Helvella crassitunicata	B	25	25	-	-	-
Helvella elastica	B	33	36	8	8	5
Hydnotrya inordinata (*Hydnotrya* sp. nov. #Trappe 787, 792)	B	3	3	1	1	-
Hydnotrya subnix (Hydnotrya subnix sp. nov. #Trappe 1861)	B	1	1	-	-	-
Hydropus marginellus (Mycena marginella)	B	9	14	5	5	1
Hygrophorus caeruleus	B	4	5	2	2	-
Hygrophorus karstenii	B	0	0	19	20	1
Hygrophorus vernalis	B	1	1	-	-	-
Hypomyces luteovirens	B	7	11	2	2	1
Leucogaster citrinus	B	8	21	34	36	33
Leucogaster microsporus	B	7	7	7	7	5
Macowanites chlorinosmus	B	2	11	2	2	-
Macowanites lymanensis	B	1	1	-	-	-

Table 3&4-8S. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, January 2004 FSEIS, New Sites Present (March 2006), and Random Multi-Species (RMS) Survey Sites.

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		Federal Land Only	Total	Federal Land Only	Total	
FUNGI						
Macowanites mollis	B	3	3	1	1	1
Marasmius applanatipes	B	2	2	4	4	3
Martellia fragrans	B	3	3	-	-	-
Martellia idahoensis	B	2	2	-	-	-
Mycena hudsoniana	B	6	7	3	3	3
Mycena overholtsii	D	130	136	10	10	3
Mycena quinaultensis	B	3	9	-	-	-
Mycena tenax	B	12	29	11	11	11
Mythicomyces corneipes	B	8	9	-	-	-
Neolentinus adhaerens	B	3	4	1	1	1
Neolentinus kauffmanii	B	20	34	1	2	1
Nivatogastrium nubigenum, In entire range except OR Eastern Cascades and CA Cascades Physiographic provinces	B	8	8	1	1	-
Octavianina cyanescens (*Octavianina* sp. nov. #Trappe 7502)	B	1	1	1	1	1
Octavianina macrospora	B	0	0	-	-	-
Octavianina papyracea	B	0	1	-	-	-
Otidea leporina	D	101	110	13	14	-
Otidea smithii	B	11	12	1	2	-
Phaeocollybia attenuata	D	78	106	48	49	6
Phaeocollybia californica	B	39	44	10	10	-
Phaeocollybia dissiliens	B	16	18	3	3	-
Phaeocollybia fallax	D	61	88	36	39	2
Phaeocollybia gregaria	B	4	4	-	-	-
Phaeocollybia kauffmanii	D	78	97	21	21	3
Phaeocollybia olivacea, In Oregon	F	0	0	27	28	-
Phaeocollybia olivacea In Washington and California	E	6	18	5	6	-
Phaeocollybia oregonensis (syn. *Phaeocollybia carmanahensis*)	B	31	36	6	6	-
Phaeocollybia piceae	B	41	46	12	13	-
Phaeocollybia pseudofestiva	B	21	31	15	15	-
Phaeocollybia scatesiae	B	13	13	8	9	-
Phaeocollybia sipei	B	38	42	14	14	1
Phaeocollybia spadicea	B	41	56	32	33	3
Phellodon atratus (Phellodon atratum)	B	8	29	2	2	-
Pholiota albivelata	B	7	14	-	-	-
Podostroma alutaceum	B	4	9	2	2	1
Polyozellus multiplex	B	53	55	10	10	-
Pseudaleuria quinaultiana	B	3	3	1	1	-
Ramaria abietina	B	4	9	11	11	-
Ramaria amyloidea	B	14	15	4	4	1
Ramaria araiospora	B	80	89	36	36	11
Ramaria aurantiisiccescens	B	22	25	1	1	-
Ramaria botryis var. *aurantiiramosa*	B	8	10	1	1	-
Ramaria celerivirescens	B	62	65	29	30	14
Ramaria claviramulata	B	1	1	-	-	-
Ramaria concolor f. marrii	B	0	0	-	-	-
Ramaria concolor f. tsugina	B	4	5	-	-	-
Ramaria conjunctipes var. *sparsiramosa* (*Ramaria fasciculata* var. *sparsiramosa)*	B	4	4	10	10	7
Ramaria coulterae	B	8	8			-
Ramaria cyaneigranosa	B	21	27	9	9	-
Ramaria gelatiniaurantia	B	13	22	9	10	-
Ramaria gracilis	B	1	2	-	-	-

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		Federal Land Only	Total	Federal Land Only	Total	
FUNGI						
Ramaria hilaris var. *olympiana*	B	0	0	-	-	-
Ramaria largentii	B	8	10	6	6	-
Ramaria lorithamnus	B	0	0	1	1	-
Ramaria maculatipes	B	8	8	1	1	-
Ramaria rainierensis	B	2	3	-	-	-
Ramaria rubella var. *blanda*	B	0	0	3	3	-
Ramaria rubribrunnescens	B	9	9	1	1	-
Ramaria rubrievanescens	B	42	46	7	7	3
Ramaria rubripermanens In Oregon	D	113	124	18	18	9
Ramaria rubripermanens In Washington and California	B	10	11	3	3	1
Ramaria spinulosa var. *diminutiva* (*Ramaria spinulosa*)	B	1	1	-	-	-
Ramaria stuntzii	B	73	76	26	27	1
Ramaria suecica	B	1	1	1	1	1
Ramaria thiersii	B	4	4	1	1	1
Ramaria verlotensis	B	0	3	-	-	-
Rhizopogon abietis	B	0	0	1	2	-
Rhizopogon atroviolaceus	B	1	1	9	9	2
Rhizopogon brunneiniger	B	6	7	-	-	-
Rhizopogon chamaleontinus (*Rhizopogon* sp. nov. #Trappe 9432)	B	1	1	-	-	-
Rhizopogon ellipsosporus (*Alpova* sp. nov. # Trappe 9730)	B	1	1	2	4	1
Rhizopogon evadens var. *subalpinus*	B	18	19	-	-	-
Rhizopogon exiguus	B	2	3	-	-	-
Rhizopogon flavofibrillosus	B	8	8	1	1	1
Rhizopogon inquinatus	B	2	2	-	-	-
Rhizopogon truncatus	D	31	55	41	44	15
Rhodocybe speciosa	B	3	3	2	2	2
Rickenella swartzii (Rickenella setipes)	B	3	8	14	19	-
Russula mustelina	B	0	0	1	1	-
Sarcodon fuscoindicus	B	27	40	8	8	6
Sedecula pulvinata	B	0	0	-	-	-
Sowerbyella rhenana (Aleuria rhenana)	B	58	68	3	3	-
Sparassis crispa	D	59	60	20	21	1
Spathularia flavida	B	24	38	13	13	9
Stagnicola perplexa	B	7	7	-	-	-
Thaxterogaster pavelekii (*Thaxterogaster* sp. nov. #Trappe 4867, 6242, 7427, 7962, 8520)	B	3	7	-	-	-
Tremiscus helvelloides	D	81	107	8	8	3
Tricholoma venenatum	B	0	0	1	1	1
Tricholomopsis fulvescens	B	2	2	1	2	-
Tuber asa (*Tuber* sp. nov. #Trappe 2302)	B	3	3	-	-	-
Tuber pacificum (*Tuber* sp. nov. #Trappe 12493)	B	2	3	-	-	-
Tylopilus porphyrosporus (Tylopilus pseudoscaber)	D	21	34	2	3	-
LICHENS						
Bryoria pseudocapillaris	A	13	24	32	32	-
Bryoria spiralifera	A	20	49	12	12	-
Bryoria subcana	B	18	18	6	6	2
Buellia oidalea	E	5	18	-	-	-
Calicium abietinum	B	9	10	1	1	-
Calicium adspersum	E	0	0	-	-	-
Cetrelia cetrarioides	E	29	60	24	25	-
Chaenotheca chrysocephala	B	21	21	18	19	14
Chaenotheca ferruginea	B	12	12	98	99	2

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			Federal Land Only	Total	Federal Land Only	Total	
LICHENS							
Chaenotheca subroscida		E	5	5	7	8	3
Chaenothecopsis pusilla		E	4	4	8	8	3
Collema nigrescens, In WA and OR, except in OR Klamath Physiographic province		F	18	28	9	9	2
Dendriscocaulon intricatulum, In California		E		23[6]	103	107	2
Dendriscocaulon intricatulum, In all of Washington and Oregon except Coos, Douglas, Curry, Josephine, and Jackson Counties		A			6	6	1
Dermatocarpon luridum		E	12	16	6	6	-
Fuscopannaria saubinetii (syn. *Pannaria saubinetii*)		E	180	190	4	4	-
Heterodermia sitchensis		E	0	0	-	-	-
Hypogymnia duplicata		C	200	211	85	85	8
Hypogymnia vittata (misspelled in FEMAT as *Hygomnia vittiata*)		E	0	0	-	-	-
Hypotrachyna revoluta		E	10	10	-	-	-
Leptogium burnetiae var. *hirsutum*		E	1	4	-	-	-
Leptogium cyanescens		A	8	10	31	31	6
Leptogium rivale		E	67	71	18	18	-
Leptogium teretiusculum		E	7	8	25	25	3
Lobaria linita, Entire range except WA Western Cascades physiographic province north of Snoqualmie Pass and Olympic Peninsula physiographic province		A	-	29	10	10	2
Lobaria oregana, In California		A	11	11	22	22	2
Microcalicium arenarium		B	0	0	2	2	-
Nephroma bellum, In OR; Klamath, Willamette Valley, Eastern Cascades; WA; Western Cascades (outside GPNF), Eastern Cascades, Olympic Peninsula physiographic provinces		E	20	20	9	9	12
Nephroma isidiosum		E	0	0	-	-	-
Nephroma occultum		C	168	168	59	60	3
Niebla cephalota		A	4	15	3	4	-
Pannaria rubiginosa		E	10	13	-	-	-
Peltigera pacifica		E	72	80	91	92	7
Platismatia lacunosa, Except in Oregon Coast Range physiographic province		E	-	37	22	22	3
Pseudocyphellaria perpetua (misapplied name *-:mougiotiana in* FEMAT and NWFP, 1994. also called *Pseudocyphellaria sp*. 1 in Management Recommendations (Lesher et al. 2000))		A	5	5	23	23	-
Pseudocyphellaria rainierensis		A	167	167	129	129	6
Stenocybe clavata		E	7	7	3	4	4
Teloschistes flavicans		A	3	9	-	-	-
Tholurna dissimilis, south of Columbia River		B	3	5	-	-	-
Usnea hesperina		E	14	17	1	1	-
Usnea longissima, In California and in Curry, Josephine, and Jackson Counties, Oregon		A	19	26	28	31	-
Usnea longissima, In Oregon, except in Curry, Josephine, and Jackson Counties and in Washington		F	115	207	115	116	9
BRYOPHYTES							
Brotherella roellii		E	5	5	-	-	-
Buxbaumia viridis, In California		E	4	5	2	2	-
Diplophyllum plicatum		B	78	80	22	22	1
Herbertus aduncus		E	8	9	12	12	-
Iwatsukiella leucotricha		B	2	2	-	16	-
Kurzia makinoana		B	3	4	1	1	-
Marsupella emarginata var. *aquatica*		B	1	1	1	1	-
Orthodontium gracile		B	2	29	-	-	-

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		Federal Land Only	Total	Federal Land Only	Total	
BRYOPHYTES						
Ptilidium californicum, In California	A	228	228	54	54	3
Racomitrium aquaticum	E	24	28	15	15	6
Rhizomnium nudum, Outside Washington	B	-	26	11	11	2
Schistostega pennata	A	59	59	22	22	-
Tetraphis geniculata	A	57	57	22	22	1
Tritomaria exsectiformis	B	15	15	5	5	-
Tritomaria quinquedentata	B	11	12	5	5	-
VERTEBRATES						
Larch Mountain salamander *Plethodon larselli*	A[8]	88	88	15	16	-
Shasta salamander *Hydromantes shastae*	A[8]	56	56	27	29	-
Siskiyou Mountains salamander *Plethodon stormi*, North Range	D[8]	143	143	182	185	-
Siskiyou Mountains salamander *Plethodon stormi*, South Range	A[8]	30	30	19	20	-
Van Dyke's salamander *Plethodon vandykei*, Cascade population only	A[8]	23	29	13	13	-
Great Gray Owl *Strix nebulosa*	A[8]	103	114	7	7	-
Oregon Red Tree Vole *Arborimus longicaudus*, Xeric, Northern Mesic	C[8]	346	346	246	252	-
MOLLUSKS						
Cryptomastix devia	A	121	148	28	30	-
Cryptomastix hendersoni	A	18	22	-	-	-
Deroceras hesperium	B	2	4	11	15	-
Fluminicola n. sp. 3	A	3	5	0	1	-
Fluminicola n. sp. 11	A	2	2	13	16	-
Fluminicola n. sp. 14	A	3	12	0	1	-
Fluminicola n. sp. 15	A	0	4	-	-	-
Fluminicola n. sp. 16	A	0	17	-	-	-
Fluminicola n. sp. 17	A	0	2	0	1	-
Fluminicola n. sp. 18	A	1	3	-	-	-
Fluminicola n. sp. 19	A	0	1	-	-	-
Fluminicola n. sp. 20	A	0	2	-	-	-
Fluminicola seminalis	A	5	15	-	-	-
Helminthoglypta talmadgei	D	761	761	365	366	-
Hemphillia burringtoni	E	17	55	8	8	1
Hemphillia glandulosa, In WA Western Cascades Physiographic Province	E	139	140	13	13	-
Hemphillia malonei, Washington	C	341	352	288	288	1
Hemphillia pantherina	B	0	0	-	-	-
Juga (O) n. sp. 2	A	3	7	1	3	-
Juga (O) n. sp. 3	A	0	4	-	-	-
Lyogyrus n. sp. 1	A	49	61	3	3	-
Lyogyrus n. sp. 2	A	3	3	-	-	-
Lyogyrus n. sp. 3	A	0	1	-	-	-
Monadenia chaceana	B	110	125	97	99	2
Monadenia fidelis minor	A	60	61	37	37	-
Monadenia troglodytes troglodytes	A	8	9	-	-	-
Monadenia troglodytes wintu	A	7	8	-	-	-
Oreohelix n. sp.	A	43	54	43	50	-
Pristiloma arcticum crateris	A	90	90	119	119	-
Prophysaon coeruleum, In California and Washington	A	112	112	18	18	-
Trilobopsis roperi	A	140	146	-	-	-
Trilobopsis tehamana	A	4	7	6	6	-
Vertigo n. sp.	A	1	1	-	-	-
Vespericola pressleyi	A	21	21	6	6	-
Vespericola shasta	A	72	78	-	-	-

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			Federal Land Only	Total	Federal Land Only	Total	
MOLLUSKS							
Vorticifex n. sp. 1		E	0	2	-	-	-
VASCULAR PLANTS							
Arceuthobium tsugense mertensianae, In Washington only		F	2	2	-	-	-
Bensoniella oregana, In California only		A	3	25	-	-	-
Botrychium minganense, In Oregon and California		A	13	16	2	2	-
Botrychium montanum		A	68	68	39	39	-
Coptis asplenifolia		A	21	21	9	9	-
Coptis trifolia		A	2	3	1	1	-
Corydalis aquae-gelidae		A	102	110	57	57	-
Cypripedium fasciculatum, Entire Range except WA Eastern Cascades physiographic province		C	-	818	374	378	-
Cypripedium montanum, Entire range except WA Eastern Cascades physiographic province		C	393	424	255	261	-
Eucephalus vialis (Aster vialis)		A	65	89	79	93	-
Galium kamtschaticum, Olympic Peninsula, WA Eastern Cascades, OR & WA Western Cascades physiographic provinces, south of Snoqualmie Pass		A	11-14	11-14	4	4	-
Platanthera orbiculata var. *orbiculata* (*Habenaria orbiculata*)		C	146	146	68	69	1
ARTHROPODS							
Canopy herbivores (south range)		F	-	-	-	-	-
Coarse wood chewers (south range)		F	-	-	-	-	-
Litter and soil dwelling species (south range)		F	-	-	-	-	-
Understory and forest gap herbivores (south range)		F	-	-	-	-	-

* These numbers were a result of a data call cutoff date as follows: For certain fungi, data entry deadline was 1/11/02; for great gray owl, amphibians and red tree vole, data entry deadline was 3/8/02; for vascular plants, bryophytes, and certain fungi data entry deadline was 6/7/02; and for mollusks and lichens, data entry deadline was 8/2/02.

** These numbers were a result of a data call cutoff date as follows: For BLM (OR and CA) and Forest Service R6, data entry deadline was 3/17/06; For Forest Service R5 wildlife, data entry deadline was 3/24/06. For Forest Service R5 botany, data entry deadline was 3/13/2006.

[8] Random Multi Sepcies (RMS) Surveys were not done for vertebrates.

(On pages 246-252, replace Table 3&4-9 with Table 3&4-9S)

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
FUNGI					
Acanthophysium farlowii			✓		
Albatrellus avellaneus			✓		
Albatrellus caeruleoporus			✓		
Albatrellus ellisii				✓	
Albatrellus flettii				✓	
Alpova alexsmithii			✓		
Alpova olivaceotinctus			✓		
Arcangeliella camphorata			✓		
Arcangeliella crassa			✓		
Arcangeliella lactarioides			✓		
Asterophora lycoperdoides			✓		
Asterophora parasitica			✓		
Baeospora myriadophylla			✓		
Balsamia nigrens			✓		
Boletus haematinus			✓		
Boletus pulcherrimus	✓		**(2004)**		
Bondarzewia mesenterica	✓				
Bridgeoporus nobilissimus			✓		
Cantharellus subalbidus	✓				
Catathelasma ventricosa			✓		
Chalciporus piperatus	✓				
Chamonixia caespitosa			✓		
Choiromyces alveolatus			✓		
Choiromyces venosus			✓		
Chroogomphus loculatus			✓		
Chrysomphalina grossula			✓		
Clavariadelphus ligula				✓	
Clavariadelphus occidentalis				✓	
Clavariadelphus sachalinensis				✓	
Clavariadelphus subfastigiatus			✓		
Clavariadelphus truncatus	✓				
Clavulina castanopes v. lignicola	✓		**(2004)**		
Clitocybe senilis			✓		
Clitocybe subditopoda			✓		
Collybia bakerensis	✓				
Collybia racemosa	✓		**(2004)**		
Cordyceps ophioglossoides			✓		
Cortinarius barlowensis				✓	
Cortinarius boulderensis			✓		
Cortinarius cyanites			✓		
Cortinarius depauperatus			✓		
Cortinarius magnivelatus			✓		
Cortinarius olympianus	✓		**(2004)**		
Cortinarius speciosissimus			✓		
Cortinarius tabularis		✓			
Cortinarius umidicola			✓		
Cortinarius valgus			✓		
Cortinarius variipes			✓		
Cortinarius verrucisporus			✓		
Cortinarius wiebeae			✓		

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
FUNGI					
Cudonia monticola				✓	
Cyphellostereum laeve			✓		
Dermocybe humboldtensis			✓		
Destuntzia fusca			✓		
Destuntzia rubra			✓		
Dichostereum boreale			✓		
Elaphomyces anthracinus			✓		
Elaphomyces subviscidus			✓		
Endogone acrogena			✓		
Endogone oregonensis			✓		
Entoloma nitidum			✓		
Fayodia bisphaerigera			✓		
Fevansia aurantiaca			✓		
Galerina cerina	✓		**(2004)**		
Galerina heterocystis				✓	
Galerina sphagnicola		**(2004)**	✓		
Gastroboletus imbellus			✓		
Gastroboletus ruber	✓		**(2004)**		
Gastroboletus subalpinus	✓				
Gastroboletus turbinatus	✓		**(2004)**		
Gastroboletus vividus			✓		
Gastrosuillus amaranthii		✓			
Gastrosuillus umbrinus			✓		
Gautieria magnicellaris			✓		
Gautieria otthii			✓		
Gelatinodiscus flavidus	✓		**(2004)**		
Glomus radiatum			✓		
~~***Gomphus bonarii***~~					
Gomphus clavatus	✓				
Gomphus kauffmanii				✓	
Gymnomyces abietis			✓		
Gymnomyces nondistincta			✓		
Gymnopilus punctifolius				✓	
Gyromitra californica				✓	
Hebeloma olympianum			✓		
Helvella crassitunicata			✓		
Helvella elastica	✓				
Hydnotrya inordinata			✓		
Hydnotrya subnix			✓		
Hydropus marginellus			✓		
Hygrophorus caeruleus			✓		
Hygrophorus karstenii	✓		**(2004)**		
Hygrophorus vernalis			✓		
Hypomyces luteovirens			✓		
Leucogaster citrinus				✓	
Leucogaster microsporus			✓		
Macowanites chlorinosmus			✓		
Macowanites lymanensis			✓		
Macowanites mollis			✓		
Marasmius applanatipes			✓		
Martellia fragrans			✓		

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
FUNGI					
Martellia idahoensis			✓		
Mycena hudsoniana			✓		
Mycena overholtsii	✓				
Mycena quinaultensis			✓		
Mycena tenax	✓		**(2004)**		
Mythicomyces corneipes			✓		
Neolentinus adhaerens			✓		
Neolentinus kauffmanii	✓		**(2004)**		
Nivatogastrium nubigenum	✓				
Octavianina cyanescens			✓		
Octavianina macrospora			✓		
Octavianina papyracea			✓		
Otidea leporina	✓				
Otidea smithii			✓		
Phaeocollybia attenuata				✓	✓
Phaeocollybia californica				✓	
Phaeocollybia dissiliens				✓	
Phaeocollybia fallax				✓	✓
Phaeocollybia gregaria			✓		
Phaeocollybia kauffmanii	✓				
Phaeocollybia olivacea	✓				
Phaeocollybia oregonensis	✓				
Phaeocollybia piceae				✓	
Phaeocollybia pseudofestiva				✓	
Phaeocollybia scatesiae				✓	
Phaeocollybia sipei				✓	
Phaeocollybia spadicea				✓	
Phellodon atratus	✓		**(2004)**		
Pholiota albivelata			✓		
Podostroma alutaceum			✓		
Polyozellus multiplex				✓	
Pseudaleuria quinaultiana			✓		
Ramaria abietina	✓		**(2004)**		
Ramaria amyloidea				✓	
Ramaria araiospora				✓	
Ramaria aurantiisiccescens				✓	
Ramaria botryis var. aurantiiramosa			✓		
Ramaria celerivirescens				✓	
Ramaria claviramulata			✓		
Ramaria concolor f. marrii		✓			
Ramaria concolor f. tsugina			✓		
Ramaria conjunctipes var. sparsiramosa	✓		**(2004)**		
Ramaria coulterae			✓		
Ramaria cyaneigranosa				✓	
Ramaria gelatiniaurantia				✓	
Ramaria gracilis			✓		
Ramaria hilaris var. olympiana			✓		
Ramaria largentii				✓	
Ramaria lorithamnus		**(2004)**	✓		
Ramaria maculatipes			✓		

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
FUNGI					
Ramaria rainierensis			✓		
Ramaria rubella var. blanda			✓		
Ramaria rubribrunnescens			✓		
Ramaria rubrievanescens				✓	
Ramaria rubripermanens				✓	✓
Ramaria spinulosa var. diminutiva			✓		
Ramaria stuntzii				✓	
Ramaria suecica			✓		
Ramaria thiersii			✓		
Ramaria verlotensis			✓		
Rhizopogon abietis			✓		
Rhizopogon atroviolaceus			✓		
Rhizopogon brunneiniger			✓		
Rhizopogon chamaleontinus			✓		
Rhizopogon ellipsosporus			✓		
Rhizopogon evadens var. subalpinus			✓		
Rhizopogon exiguus			✓		
Rhizopogon flavofibrillosus			✓		
Rhizopogon inquinatus			✓		
Rhizopogon truncatus				✓	✓
Rhodocybe speciosa			✓		
Rickenella swartzii	✓		**(2004)**		
Russula mustelina		**(2004)**	✓		
Sarcodon fuscoindicus				✓	
Sedecula pulvinata			✓		
Sowerbyella rhenana				✓	
Sparassis crispa				✓	✓
Spathularia flavida				✓	
Stagnicola perplexa			✓		
Thaxterogaster pavelekii			✓		
Tremiscus helvelloides				✓	✓
Tricholoma venenatum		**(2004)**	✓		
Tricholomopsis fulvescens			✓		
Tuber asa			✓		
Tuber pacificum			✓		
Tylopilus porphyrosporus	✓		**(2004)**		
LICHENS					
Bryoria pseudocapillaris			✓		
Bryoria spiralifera			✓		
Bryoria subcana			✓		
Buellia oidalea			✓		
Calicium abietinum		✓			
Calicium adspersum		✓			
Cetrelia cetrarioides	✓				
Chaenotheca chrysocephala	✓	**(2004)**			
Chaenotheca ferruginea	✓	**(2004)**			
Chaenotheca subroscida			✓		
Chaenothecopsis pusilla			✓		
Collema nigrescens	✓				
Dendriscocaulon intricatulum	✓[3]				
Dermatocarpon luridum	✓				

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
LICHENS					
Fuscopannaria saubinetii			✓		
Heterodermia sitchensis		✓			
Hypogymnia duplicata	✓				
Hypogymnia vittata		✓			
Hypotrachyna revoluta			✓		
Leptogium burnetiae var. hirsutum		✓			
Leptogium cyanescens			✓		
Leptogium rivale	✓				
Leptogium teretiusculum			✓		
Lobaria linita	✓				
Lobaria oregana			✓		
Microcalicium arenarium		✓			
Nephroma bellum	✓				
Nephroma isidiosum		✓			
Nephroma occultum				✓	✓
Niebla cephalota			✓		
Pannaria rubiginosa	**(2004)**		✓		
Peltigera pacifica	**(2004[1]) - ✓**				
Platismatia lacunosa	✓				
Pseudocyphellaria perpetua			✓		
Pseudocyphellaria rainierensis				✓	✓
Stenocybe clavata		✓			
Teloschistes flavicans			✓		
Tholurna dissimilis		✓			
Usnea hesperina			✓		
Usnea longissima	✓				
BRYOPHYTES					
Brotherella roellii		✓			
Buxbaumia viridis	✓				
Diplophyllum plicatum	✓				
Herbertus aduncus		✓			
Iwatsukiella leucotricha	✓				
Kurzia makinoana		✓			
Marsupella emarginata v. aquatica	**(2004)**			✓	
Orthodontium gracile	✓				
Ptilidium californicum	✓				
Racomitrium aquaticum	✓	**(2004)**			
Rhizomnium nudum	✓				
Schistostega pennata	✓				
Tetraphis geniculata	✓				
Tritomaria exsectiformis		✓			
Tritomaria quinquedentata		✓			
VERTEBRATES					
Larch Mountain salamander ***Plethodon larselli***	**(2004) - ✓[2]**				
Shasta salamander ***Hydromantes shastae***	**(2004) - ✓[2]**				
Siskiyou Mountains salamander ***Plethoson stormi*[5]**	**(2004[1]) - ✓[2]**				
Van Dyke's salamander ***Plethodon vandykei***	**(2004) - ✓[2]**				

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
VERTEBRATES					
Great Gray Owl ***Strix nebulosa***	**(2004) -** ✓[3]				
Oregon Red Tree Vole ***Arborimus longicaudus***	**(2004[1]) -** ✓[4]				
MOLLUSKS					
Cryptomastix devia	✓				
Cryptomastix hendersoni	✓				
Deroceras hesperium	✓				
Fluminicola n. sp. 3	✓				
Fluminicola n. sp. 11	✓				
Fluminicola n. sp. 14				✓	
Fluminicola n. sp. 15				✓	
Fluminicola n. sp. 16				✓	
Fluminicola n. sp. 17				✓	
Fluminicola n. sp. 18				✓	
Fluminicola n. sp. 19				✓	
Fluminicola n. sp. 20				✓	
Fluminicola seminalis	✓[3]				
Helminthoglypta talmadgei	**(2004[1]) -** ✓				
Hemphillia burringtoni	✓				
Hemphillia glandulosa	✓				
Hemphillia malonei	✓				
Hemphillia pantherina	**(2004)**	✓			
Juga (O) n. sp. 2	✓				
Juga (O) n. sp. 3				✓	
Lyogyrus n. sp. 1	✓				
Lyogyrus n. sp. 2	✓				
Lyogyrus n. sp. 3				✓	
Monadenia chaceana	✓[3]				
Monadenia fidelis minor	✓				
Monadenia troglodytes troglodytes	✓				
Monadenia troglodytes wintu	✓				
Oreohelix n. sp.	✓				
Pristiloma arcticum crateris	✓				
Prophysaon coeruleum	✓				
Trilobopsis roperi	✓				
Trilobopsis tehamana	✓				
Vertigo n. sp.	✓				
Vespericola pressleyi	✓				
Vespericola shasta	✓				
Vorticifex n. sp. 1				✓	
VASCULAR PLANTS					
Arceuthobium tsugense mertensianae	✓				
Bensoniella oregana	✓				
Botrychium minganense	✓				
Botrychium montanum	✓				
Coptis asplenifolia	✓				
Coptis trifolia	✓				
Corydalis aquae-gelidae	✓				
Cypripedium fasciculatum	✓				
Cypripedium montanum	✓[2]				

Table 3&4-9S. Species Outcomes

Parenthetical dates shows outcomes in the 2004 FSEIS that have changed because of new information or corrections to analysis.

TAXA GROUP *Species*	Sufficient Habitat Under All Alternative	Insufficient Information to Determine Outcome	Insufficient Habitat		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
VASCULAR PLANTS					
Eucephalus vialis	✓				
Galium kamtschaticum	✓				
Platanthera orbiculata var. orbiculata	✓				
ARTHROPODS					
Canopy herbivores		✓			
Coarse wood chewers		✓			
Litter and soil dwelling species		✓			
Understory and forest gap herbivores		✓			

[1] In 2004 this species had sufficient habitat range-wide in the NWFP area, but had insufficient habitat in a portion of the range (for one or more alternatives).
[2] This species has sufficient habitat range wide under all alternatives, but under Alternatives 2 and 3, the species has insufficient habitat in a portion of the range.
[3] This species has sufficient habitat range wide under all alternatives, but under Alternative 2, the species has insufficient habitat in a portion of the range.
[4] This species has sufficient habitat range wide under all alternatives, but the species has insufficient habitat in a portion of the range under all alternatives and insufficient habitat on an additional portion of its range under Alternatives 2&3.
[5] Includes Scott Bar salamander.

Table 3&4-9.1S. (New Table) **Species Outcomes for 145 Species Assumed to be in SSSP Under Alternatives 2 or 3 Under the Scenarios of Alternatives 2 and 3 Without SSSP.**

TAXA GROUP *Species with sufficient habitat in all or most of their range under all alternatives when assumed to be on SSSP under Alternatives 2 or 3*[5]	**Sufficient Habitat Under All Alternatives without SSSP**	**Insufficient Habitat**	
		Caused by Management Under Alt. 2 without SSSP	**Caused by Management Under Alt. 3 without SSSP**
FUNGI			
Boletus pulcherrimus		✓	
Clavulina castanopes v. *lignicola*	✓		
Collybia racemosa		✓	
Phaeocollybia olivacea	✓[3]		
Phaeocollybia oregonensis		✓	
LICHENS			
Cetrelia cetrarioides	✓[3]		
Collema nigrescens	✓		
Dendriscocaulon intricatulum[6]	✓[3]		
Dermatocarpon luridum		✓	
Hypogymnia duplicata	✓		
Lobaria linita	✓[3]		
Nephroma bellum	✓[3]		
Peltigera pacifica	✓		
Platismatia lacunosa	✓[3]		
Usnea longissima	✓[3]		
BRYOPHYTES			
Buxbaumia viridis		✓	
Diplophyllum plicatum		✓	
Iwatsukiella leucotricha		✓	
Orthodontium gracile	✓		
Ptilidium californicum	✓		
Rhizomnium nudum	✓		
Schistostega pennata		✓	
Tetraphis geniculata		✓	
VERTEBRATES			
Larch Mountain salamander *Plethodon larselli*[6]	✓[2]		
Shasta salamander *Hydromantes shastae*[6]	✓[2]		
Siskiyou Mountains salamander *Plethodon stormi*[4,6]	✓[2]		
Van Dyke's salamander *Plethodon vandykei*[6]	✓[2]		
Great Gray Owl *Strix nebulosa*[6]	✓[3]		
Oregon Red Tree Vole *Arborimus longicaudus*[6]	✓[1]		
MOLLUSKS			
Cryptomastix devia		✓	
Cryptomastix hendersoni		✓	
Deroceras hesperiu		✓	
Fluminicola n. sp. 3		✓	
Fluminicola n. sp. 11		✓	
Fluminicola seminalis[6]		✓	
Helminthoglypta talmadgei	✓		
Hemphillia burringtoni		✓	
Hemphillia glandulosa	✓		

Table 3&4-9.1S. (New Table) **Species Outcomes for 145 Species Assumed to be in SSSP Under Alternatives 2 or 3 Under the Scenarios of Alternatives 2 and 3 Without SSSP.**

TAXA GROUP *Species with sufficient habitat in all or most of their range under all alternatives when assumed to be on SSSP under Alternatives 2 or 3*[5]	**Sufficient Habitat Under All Alternatives without SSSP**	**Insufficient Habitat**	
		Caused by Management Under Alt. 2 without SSSP	**Caused by Management Under Alt. 3 without SSSP**
MOLLUSKS			
Hemphillia malonei	✓		
Juga (O) n. sp. 2		✓	
Lyogyrus n. sp. 1		✓	
Lyogyrus n. sp. 2		✓	
Monadenia chaceana[6]		✓	
Monadenia fidelis minor		✓	
Monadenia troglodytes troglodytes		✓	
Monadenia troglodytes wintu		✓	
Oreohelix n. sp.		✓	
Pristiloma arcticum crateris		✓	
Prophysaon coeruleum	✓		
Trilobopsis roperi		✓	
Trilobopsis tehamana		✓	
Vertigo n. sp.		✓	
Vespericola pressley		✓	
Vespericola shasta		✓	
VASCULAR PLANTS			
Bensoniella oregana		✓	
Botrychium minganense		✓	
Botrychium montanum	✓		
Coptis asplenifolia	✓		
Coptis trifolia		✓	
Corydalis aquae-gelidae		✓	
Cypripedium fasciculatum		✓	✓
Cypripedium montanum[6]		✓	✓
Eucephalus vialis		✓	
Galium kamtschaticum	✓		

[1] While having sufficient habitat range-wide in the NWFP area, the species has insufficient habitat in a portion of the range.
[2] While having sufficient habitat range-wide in the NWFP area, the species has insufficient habitat under the scenarios of Alternatives 2 and 3 without SSSP in a portion of the range.
[3] While having sufficient habitat range-wide in the NWFP area, the species has insufficient habitat under the scenario of Alternative 2 without SSSP in a portion of the range.
[4] Includes Scott Bar salamander.
[5] For the remaining 81 species that are assumed to be on SSSP, outcomes remain unchanged under the scenario of not being on SSSP.
[6] Species with habitat sufficient to support stable populations range-wide in the NWFP area, although there is insufficient habitat to support stable populations in a portion of the NWFP area under Alternative 2 (and 3 for *C. montanum*).

Glossary

(Insert the following terms into the Glossary which begins on page 253.)

Anthropogenic - Involving the impact of humans on nature; effects or processes derived, induced or altered by the presence and activities of humans.

Annual Species Review (ASR) – A regional-level interagency group including taxa experts meeting at least annually to weigh new information about species against the three basic criteria for inclusion/retention in Survey and Manage, and make decisions about additions and deletions of species or moving them between categories. The process and the criteria to which the group must adhere is described in the Survey and Manage Standards and Guidelines, 2004 FSEIS, Volume II, pp. 19-21.

Bayesian Statistics - Bayesian inference uses aspects of the scientific method, which involves collecting evidence that is meant to be consistent or inconsistent with a given hypothesis. As evidence accumulates, the degree of belief in a hypothesis changes. With enough evidence, it will often become very high or very low.

Clade - A group of organisms, such as a species, whose members share homologous features derived from a common ancestor.

Congener - A member of the same kind, class, or group; an organism belonging to the same taxonomic genus as another organism.

GeoBOB (Geographic Biotic Observations) – A relational geodatabase used by the Oregon and Washington offices of the BLM which stores spatial and attribute data on species of interest to the BLM and the Region 6 of the Forest Service. This database currently holds legacy Survey and Manage species locations through 2005 for both the BLM and the Forest Service. In mid-2006, the data on Survey and Manage species on lands administered by the Forest Service will be moved to the Forest Service databases.

Haplotype - A set of closely linked genetic markers present on one chromosome which tend to be inherited together (not easily separable by recombination).

Hectare (ha) – 10,000 meters2 (about 2.5 acres)

Hypermaritime - Very wet maritime, typically restricted to lower elevations very near the coast (fog belt).

In-growth - A growing inward (as to fill a void). Used herein, refers to acreage increases (as a result of aging or growth) of late-successional and old-growth forests within defined areas such as reserves.

Macroinvertebrates - Any non-vertebrate organism that is large enough to been seen without the aid of a microscope and lives in or on the bottom of a body of water.

Mesic - Of, characterized by, or adapted to a moderately moist habitat.

Mitigation – From NEPA implementing regulations: Avoiding, minimizing, rectifying, reducing, or compensating for adverse effects of a proposed action or alternatives.

Odds Ratio - A measure of effect size particularly important in Bayesian statistics and logistic regression. It is defined as the ratio of the odds of an event occurring in one group to the odds of it occurring in another group, or to a data-based estimate of that ratio. An odds ratio of 1 indicates that the condition or event under study is equally likely in both groups.

Provinces – Areas of common biological and physical processes. Unless otherwise stated, assumes the 12 Physiographic Provinces described in the Northwest Forest Plan Record of Decision, Attachment A, page A-3.

Random Double Sample (RDS) – A two-phase random survey where a subset of the first-phase plots are selected for more a detailed, or larger, examination. Used for red tree vole strategic surveys.

Random Multi Species (RMS) Survey – The systematic random plot survey, stratified by forest age and reserve/non-reserve land allocation, done for most Survey and Manage species to provide information on species occurrence, distribution, range, and habitat, and refine habitat characterization. See broad-scale Strategic Surveys, Survey and Manage Standards and Guidelines, 2004 FSEIS Volume II, p. 30.

Strategic Survey – Survey and Manage surveys at the landscape, population, or site-specific scale to address questions that relate to identified objectives for each category. May range from random plot surveys with broad statistical inference, to habitat-focused proposive surveys designed to locate species sites and confirm suspected habitats (v. pre-disturbance or clearance surveys.) See 2004 FSEIS, Volume II, p. 29.)

Stochastic Event - random event, such as fire, landslide, hurricane, etc.

Xeric - Of, characterized by, or adapted to an extremely dry habitat.

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Specialists

James Alegria: *Biometrician and Vegetation Inventory Lead*. Jim received a B.S. in Forest Management from the University of Massachusetts and a M.S. in Forest Biometrics from the University of Washington. He has provided statistical consultation services for the BLM since 1990 and for the Forest Service Pacific Northwest Region since 2000 in addition to his vegetation inventory responsibilities. Jim has co-authored publications on the strategic survey framework for the Survey and Manage program, the sample design for the strategic survey framework, and trends of late-successional and old-growth forests within the Northwest Forest Plan area. In addition, he has conducted a risk assessment to marbled murrelets from ground disturbing activities in southwest Oregon in conjunction with personnel from the BLM, Forest Service, and USFWS.

Carol Apple: *Mathematical Statistician*. Carol received her B.S. in Forest Science from Pennsylvania State University and an M.S. in Forest Biometrics from the University of Minnesota. She has worked for the Forest Service since 1986, starting in Land Management Planning on the Salmon National Forest in Idaho and later the Tahoe National Forest in California. In 1990 she moved to the Pacific Northwest Regional Office and as part of the Ecology, Range, Watershed and Air Unit. There she provided coordination and support for a regional stream inventory application and database. In 2000 she joined the Oregon/Washington BLM and R6 Forest Service integrated Natural Resources Inventory Group. Her work involves statistical consultation for both agencies, analysis of the Current Vegetation Survey (CVS) plots, and involvement in application development.

Michael Castellano: *Research Forester*. Michael has a B.S. in Forest Management, a M.S. in Tree Physiology and a Ph.D. in Forest Ecology from Oregon State University. He is

currently employed with the Forest Service at the Forestry Sciences Laboratory in Corvallis, Oregon. Michael has conducted research on forest fungi since 1980. He has been the Fungal Taxa Lead for both the Northwest Forest Plan and the Interior Columbia River Basin Assessment. The primary focus of his current research is biogeography, biodiversity, ecology, systematics and taxonomy of forest fungi.

Thomas DeMeo: *Regional Ecologist*. Tom has a B.S. in Forest Science (Penn State University), a M.S. in Forest Science (Oregon State University), and a Ph.D. in wildlife biology (West Virginia University). An ecologist with the Forest Service since 1987, he has experience in ecological classification, mapping, monitoring, wetlands, old-growth, alternative silvicultural methods, conservation biology, landscape ecology, fire ecology, and wildlife habitat assessment. He also administers the ecology program for the Pacific Northwest Region. Since 2004 he has worked part-time for the National Interagency Fuels Technology Transfer team, and serves with this cadre providing FRCC and LANDFIRE training/support. He is a certified Fire Regime Condition Class (FRCC) instructor and leads the FRCC effort in the Region.

Rick Dewey: *Botanist*. Rick has a B.S. degree in Zoology from San Diego State University, B.S. and M.A. degrees in Natural Resources and Biology from Humboldt State University, and a Ph.D. in Botany from Texas A&M University. He was a member of the Survey and Manage bryophyte taxa team from its inception in 1998 to its dissolution in 2004. Rick has been a botanist on Deschutes National Forest since 1997.

Eric Forsman: *Research Wildlife Biologist*. Eric has a Ph.D. in Wildlife Management from Oregon State University. He conducts research on spotted owls and other forest birds, and is also conducting a variety of studies on the distribution, genetics, and ecology of tree voles. He works at the Forest Service Pacific Northwest Research Station in Corvallis, Oregon.

Bill Gaines: *Forest Wildlife Ecologist*. Bill has a B.S. and M.S. in Biology from Central Washington University and a Ph.D. in Wildlife Science from University of Washington. He has worked in the Eastern Cascades for most of his 21 years with the Forest Service, but has also worked on the Caribbean National Forest and on international projects in Pakistan and Ecuador. He now works on the Okanogan and Wenatchee National Forests.

Linda Geiser: *Ecologist*. Linda has a Ph.D. in Plant Physiology from the University of California, Davis. She is an ecologist for the Forest Service Pacific Northwest Region Air Resource Management Program. She is a specialist in lichen biomonitoring and a co-author of two books featuring regional lichen flora, "Lichens of Southeast Alaska" and "Macrolichens of the Pacific Northwest". She has co-authored numerous Forest Service publications and scientific articles on the conservation and management of rare lichens in the Pacific Northwest. She was a member of the Survey and Manage lichen taxa team from 1994-2004.

Richard Helliwell: *Botanist*. Richard has a B.S. in Biology from Southern Oregon State College and a B.A. in Anthropology from the University of Maryland. He has been a botanist with the Forest Service since 1989, serving initially on the Mt. Hood and Ochoco National Forests. Since 1995, he has been the forest botanist on the Umpqua National Forest. From 2001-2004, he was the Survey and Manage bryophyte team lead for the Northwest Forest Plan Area. Richard was previously employed on the Warm Springs Indian Reservation doing ecological and ethnobotanical studies.

Jeremy Hruska: *GIS Specialist*. Jeremy has a B.S. in Geography with a GIS option from Oregon State University and is working towards a M.S. degree in GIS through Penn State University. He has worked as a contractor for the BLM for over 5 years on various analysis projects and is the GIS Training Specialist for the OR/WA BLM state office.

Deanna H. Olson: *Research Ecologist*. Dede has a B.A. in Biology, with a concentration area in Population Biology, from the University of California at San Diego, and a Ph.D. in Zoology from Oregon State University. She has worked with the Forest Service Pacific Northwest Research Station since 1990. She serves as associate editor for Herpetological Review, co-chairs the Northwest regional working group of Partners for Amphibian and Reptile Conservation, and has courtesy faculty appointments at Oregon State University. She was the Northwest Forest Plan Survey and Manage amphibian taxa lead from 1994-2000, and amphibian taxa expert 2001-2004. She was a member of the FEMAT amphibian panel, and contributed to the effects analyses of the 2000 and 2004 Survey and Manage SEISs. Her research addresses amphibian ecology and management in northwestern forest systems.

Richard Phillips: *Economist*. Richard has a M.S. in Forest Management and two years of graduate level studies in Economics and Operations Research Analysis from Colorado State University. He has worked as an economist for over 25 years primarily for the Forest Service. Richard currently serves as the Regional Economist for the Pacific Northwest Region.

Ed Reilly: *GIS Analyst*. Ed is currently an Environmental Coordinator and Planner with the BLM in Medford. He has worked extensively with Geographic Information Systems (GIS) and satellite image processing to map and analyze ecosystems in Southern Oregon. Ed served as a member of the Northwest Forest Plan Amphibian taxa team tasked with developing survey protocols, management recommendations and conservation planning for salamander species of the Northwest region. He has participated in preparation of numerous local and regional analyses, most recently preparation of several community fire plans. Prior to his work for BLM, Ed worked for over twenty years as a natural resource manager for the Rogue River National Forest.

Kary E. Schlick: *Wildlife Biologist*. Kary has a B.A. in Zoology and Biodiversity from Humboldt State University. She was on the Northwest Forest Plan Survey and Manage mollusk taxa team from 2001-2004 and spent seven years at the PSW Redwood Science Laboratory as a Herpetologist. Since 1998, she's overseen coordination and implementation of pre-project and strategic surveys for the Northwest Forest Plan. She currently works on the Six Rivers National Forest.

Thomas S. Sensenig: *Ecologist*. Tom has a B.S. in Forest Science from West Virginia University, a M.S. in Forest Resources in forest entomology and pathology from University of Washington, and a Ph.D. in Forest Ecology from Oregon State University. He worked for the BLM as a forester, silviculturist and ecologist for 23 years. Since 2004 Tom has been the Southwest Oregon Area Ecologist with the Forest Service.

Martin Stein: *Botanist*. Marty has a B.S. in Forestry from the University of Massachusetts. He has 22 years of experience with the Forest Service, the last 19 as a botanist in Oregon and Washington. He is currently the forest botanist on the Siuslaw National Forest.

Marianne Turley: *Mathematical statistician*. Marianne has a B.S. in Applied Mathematics from the University of Massachusetts and a M.S. and a Ph.D. in Quantitative Ecology and Resource Management from the University of Washington. Her research has focused on the methodology and application of quantitative assessments of ecological populations, processes, and theories using statistical and applied mathematical approaches. Marianne is working for the BLM and the Forest Service on the analysis, interpretation, and documentation of the Survey and Manage Random Multi-Species probability survey (a.k.a. the Random Grid). She also provides other statistical support to aid managers and biologists in the use of quantitative information.

Kent Woodruff: *Wildlife Biologist*. Kent graduated in 1977 from Colorado State University in Fort Collins with a degree in Wildlife Biology. Kent has specialized in birds and bats for

much of his career coordinating several projects to study the habitat requirements and life history of uncommon species. In 1978 he initiated a project to monitor great gray owl pairs in southeastern Idaho. In 1991 he and his wife documented the first nesting great gray owls in Washington and he continues to pursue further understanding of their ecology. In his job as a Forest Service District wildlife biologist, Kent has the opportunity to apply his nearly 30 years of previous experience to current challenges for species conservation

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Janice Johnson

PBS Environmental and Engineering

Kelli VanNorman

Eugene Kunze

Distribution List and Document Availability on the Internet

This Draft Supplement to the 2004 Final Supplemental Environmental Impact Statement (SEIS) is being sent to the following individuals, groups, and organizations. The list includes elected officials; federal agencies; state, local, and county governments; American Indian Tribes and Nations; businesses; other organizations; libraries; and individuals.

The Draft and Final Supplement and the 2004 FSEIS will also be available on the internet at: http://www.reo.gov/s-m2006.

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Senator Dianne Feinstein
Representative Wally Herger
Representative Doris Matsui
Representative Mike Thompson
Representative Lynn Woolsey

Oregon
Senator Gordon Smith
Senator Ron Wyden
Representative Earl Blumenauer
Representative Peter DeFazio
Representative Darlene Hooley
Representative Greg Walden
Representative David Wu

Washington
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Senator Patty Murray
Representative Brian Baird
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Nolan C Colegrove, *California Indian Forest and Fire Management Council*
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Bruce Davies, *Northwest Indian Fisheries Commission*
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Steve Thompson, *US Fish & Wildlife Service California/Nevada Operations*
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Alex Whistler, *Bureau of Indian Affairs*
John Woolley, *County of Humboldt*

Federal Agencies

Advisory Council on Historic Preservation
Bonneville Power Administration
Environmental Protection Agency
- Operations Office

Federal Aviation Administration
- NW Mountain Region
- Western Pacific Region

Federal Energy Regulatory Commission
- Portland Office

Regional Ecosystem Office
U.S. Department of Agriculture
- Animal and Plant Health Inspection Service
- Forest Service
  - Pacific Northwest Regional Office
  - Pacific Southwest Regional Office
  - Pacific Northwest Research Station
  - Pacific Southwest Research Station
  - *California*
  - Klamath National Forest
  - Lassen National Forest
  - Mendocino National Forest
  - Modoc National Forest
  - Shasta-Trinity National Forest
  - Six Rivers National Forest
  - *Oregon*
  - Deschutes National Forest
  - Fremont-Winema National Forests
  - Mt. Hood National Forest
  - Rogue River-Siskiyou National Forests
  - Siuslaw National Forest
  - Umpqua National Forest
  - Willamette National Forest
  - *Washington*
  - Gifford Pinchot National Forest
  - Mt. Baker-Snoqualmie National Forest
  - Okanogan – Wenatchee National Forests
  - Olympic National Forest
- Natural Resources Conservation Service

U.S. Department of Commerce
- NOAA Fisheries
  - Northwest Regional Office
  - Southwest Regional Office
  - Washington State Habitat Office
  - Arcata Field Office
  - Roseburg Field Office

U.S. Department of Defense
- Air Force Deputy Asst. Secretary of Defense
- Army Corps of Engineers
  - Northwest Division
  - PE PF
  - Seattle District
  - South Pacific
  - Walla Walla District
- Naval Submarine Base Bangor

U.S. Department of Energy
U.S. Department of Housing and Urban Development
- Environmental Review Division
- Office of Community Planning & Development
- San Francisco Environmental Review Office

U.S. Department of Interior
- Bureau of Indian Affairs
  - Environmental Coordinator
  - Aberdeen, WA Office
  - Portland Area Office
- Bureau of Land Management
  - *California*
  - State Office
  - *Oregon*
  - State Office
  - Coos Bay District
  - Eugene District
  - Lakeview District
  - Medford District
  - Roseburg District
  - Salem District
- Bureau of Reclamation - Pacific NW Region
- Fish and Wildlife Service
  - Oregon Office
  - Bend Field Office

Tulelake National Wildlife Refuge
Geological Survey
Biological Resources Division
Pacific Northwest District
National Park Service
Fort Vancouver National Historic Site
Olympic National Park
Pacific Northwest Region
Redwood National Park
Office of Environmental Policy & Compliance
Office of the Regional Solicitor
Regional Environmental Office
U.S. Department of Justice
U.S. Department of Transportation
Federal Highway Administration
Oregon Division
Western Division
Western Federal Lands Highway Division
U.S. Ecosystem Restoration Office
U.S. Small Business Administration

State, County, and Local Governments

British Columbia
Ministry Of Water, Land & Air Protection

California
California Regional Water Quality
Caltrans
City of Yreka
Colusa County
Agricultural Department
County of Siskiyou
Del Norte County Board of Supervisors
Department of Fish and Game
Department of Forestry
Department of Forestry & Fire Protection
Department of Water Resources
EEL - Russian River Commission
Glenn County
Agricultural Department
Board of Directors
Board of Supervisors
U.C. Cooperative Extension
Humboldt County Board of Supervisors
Lake County Board of Supervisors
Mendocino County
Board of Supervisors
Planning Department
Water Agency
Board of Supervisors
U.C. Cooperative Extension
North California Water Association
Office of the Governor
Resources Agency
Shasta County Board of Supervisors
Siskiyou County
Administrators
Board of Supervisors
Sonoma County Conservation Action
State Clearinghouse
State Lands Commission
Tehama County
Board of Supervisors
Planning Department
Trinity County Board of County Supervisors

Colorado
San Miguel County

District of Columbia
Rural Utilities Service

Oregon
City of Cottage Grove
City of Klamath Falls
City of Detroit City Hall
Coos County Board of Commissioners
Curry County Board of Commissioners
Department of Agriculture
Department of Energy
Department of Fish & Wildlife
Department of Forestry
Department of Geology and Mineral Industries
Department of Human Resources
Department of Revenue
Department of Transportation
District 17 Watermaster
Douglas County
Board of Commissioners
Planning Department
Employment Department
Executive Department
Farm Bureau Federation
Hood River County
Jackson County Commissioners
Jefferson County Commissioners
Josephine County
Courthouse
Forestry Department
Planning Department
Klamath Basin Water Resources Advisory Committee
Klamath County Commissioners
Klamath Irrigation District
Klamath Soil & Water Conservation
Lake County

Lane County Commissioner
Meadows Drainage District
Mohawk Watershed Planning Group
Northwest Power Planning Council
ODA - Noxious Weed Control Program
Office of the Governor
Oregon State Public Interest Research Group
Parks and Recreation
Portland Chamber of Commerce
Portland Water Bureau
Rogue Institute of Economy and Ecology
Rogue Valley Council of Governments
Roseburg DEQ Office
Small Business Administration
Southeastern Advisory Council
State Historic Preservation Office
State Marine Board
State Police
Tillamook County Commissioner
Umpqua Regional Council of Governments
Water Resources Department

Washington

Chelan County Planning Department
City of Port Townsend
Clallam County Commissioner
Department of Ecology
Department of Fish & Wildlife
Department of Natural Resources
Department of Transportation
Forks Chamber of Commerce
Governor's Special Asst
Jefferson County Commissioners
Lewis County Commissioners
Mason County Commissioner
Office of the Governor
Skagit County
Skamania County Planning Dept
Washington State Association of Counties

American Indian Tribes and Nations

Alturas Indian Rancheria
Bear River Band Rohnerville Rancheria
Big Lagoon Rancheria
Big Valley Band Pomo Indians Rancheria
Blue Lake Rancheria
Cahto Indian Tribe Laytonville Rancheria
Cher-Ae Heights Community Trinidad Rancheria
Cloverdale Rancheria of Pomo Indians
Colorado River Indian Tribes Reservation
Confederated Tribes & Bands of the Yakama Nation
Confederated Tribes of Siletz Indians of Oregon
Confederated Tribes of the Chehalis Reservation
Confederated Tribes of the Colville Reservation
Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians of Oregon
Confederated Tribes of the Grand Ronde Community
Confederated Tribes of the Warm Springs
Coquille Indian Tribes
Cortina Indian Rancheria of Wintun Indians
Cow Creek Band of Umpqua Tribe of Indians
Cowlitz Indian Tribe
Coyote Valley Band of Pomo Indians
Dry Creek Rancheria of Pomo Indians
Elem Indian Colony Pomo Sulphur Bank Rancheria
Elk Valley Rancheria
Grindstone Rancheria of Wintun-Wailaki Indians
Guidiville Band of Pomo Indians
Hoh Indian Tribe
Hoopa Valley Tribe
Hopland Band of Pomo Indians Rancheria
Jamestown S'Klallam Tribe of Indians
Karuk Tribe of California
Kashia Band Pomo Stewarts Point Rancheria
Klamath Indian Tribe of Oregon
Lower Elwha Tribal Community
Lower Lake Rancheria
Lummi Tribe of the Lummi Reservation, Washington
Lytton Rancheria of California
Makah Indian Tribe of the Makah Indian Reservation
Manchester-Point Arena Band Pomo Indians Rancheria
Mechoopda Indian Tribe of Chico Rancheria
Middletown Rancheria of Pomo Indians
Mooretown Rancheria
Muckleshoot Indian Tribe
Nisqually Indian Community
Nooksack Indian Tribe
Paskenta Band of Nomlaki Indians
Pit River Tribe of California
Port Gamble Band of S'Klallam Indians
Potter Valley Rancheria of Pomo Indians
Puyallup Tribe of the Puyallup Reservation of the State of Washington
Quartz Valley Indian Community Reservation
Quileute Tribe of the Quileute Reservation
Quinault Indian Nation
Redding Rancheria
Redwood Valley Rancheria of Pomo Indians
Resighini Rancheria (Coast Indian Community Yurok)
Round Valley Indian Reservation
Rumsey Indian Rancheria of Wintun Indians
Samish Indian Nation
Sauk-Suiattle Indian Tribe
Scotts Valley Band of Pomo Indians
Sherwood Valley Rancheria of Pomo Indians
Shoalwater Bay Indian Tribe of the Shoalwater Bay Indian Reservation
Skokomish Indian Tribe
Smith River Rancheria

Snoqualmie Tribal Organization
Squaxin Island Tribe
Stillaguamish Tribe of Indians
Suquamish Tribe of the Port Madison Reservation, Washington
Susanville Indian Rancheria
Swinomish Indian Tribal Community
Table Bluff Reservation-Wiyot Tribe
The Klamath Tribes
The Tulalip Tribes
Upper Lake Band of Pomo Indians Rancheria
Upper Skagit Indian Tribe
Yurok Tribe

Businesses

Armco
Brecher & Volker LLP
Crystal Mountain
David Evans and Associates, Inc.
Deixis Consultant
Douglas Timber Operators
DRJohnson Lumber Co.
Haglund, Kirtley, Kelley and Horngren
Huffman & Wright Timber Corp.
Industrex Unlimited
Land & Water Consulting, Inc.
Lone Rock Timber Co.
Mater Engineering Ltd
McFarland Cascade
Meridian Environmental
Mt Hood Meadows
Pacific Analytics LLC
Pacific Northwest Ski Areas Assn.
Pacific Power and Light
Saltman and Stevens PC
Sequoia Associates
Simpson Door Co.
Siskiyou Coop, Inc.
Swanson Group
T & E Inc.
The Nicholoff Company
The Phoenix Zoo
Thinking Inc
Timberland Logging
US Timberlands Klamath Falls LLC
Woolley Enterprises Inc

Other Organizations

Allegheny Defense Project
American Alpine Institute
Arc-En-Ciel
Association of O & C Counties
Bark
Blue Mountains Biodiversity Project
Cascadia Wildlands Project
Center for Biological Diversity
Citizens Interested In Bull Run
Conservation Northwest
Environmental Protection Information Center
Gifford Pinchot Task Force
Headwaters
Izaak Walton League of America
Kalmiopsis Audubon Society
Kitsap Audubon Society
Kittitas Audubon Society
Klamath Forest Alliance
Klamath Siskiyou Wildlands Center
Native Plant Society Of OR, Audubon
North Coast Recreation Coalition / LC 4x4's
Northcoast Environmental Center
Northern CA Society of American Foresters
Northwest Ecosystem Alliance
Oregon Mycological Society
Oregon Natural Resources Council
Oregon Wildlife Federation
Pacific Biodiversity Institute
Pacific Northwest 4 Wheel Drive
PEER
Provincial Interagency Executive Committees
- California Coast
- Deschutes
- Eastern Washington Cascades
- Klamath
- Olympic Peninsula
- Oregon Coast
- Sacramento
- Southwest Oregon
- Southwest Washington
- Western Washington Cascades
- Willamette
- Yakima

Public Lands Foundation
Seattle Lichen Guild
Siskiyou Audubon Society
Siskiyou Project
The Wilderness Society
Trails Club of Oregon
Umpqua Watersheds
WA State Hi-Lakers
Washington Trout
Wildwest Institute
Willits Environmental Center
World Wildlife Fund's Klamath-Siskiyou EcoRegion

Libraries, Schools, and Universities

Aberdeen Timberland Library
Albany City Library
Albina Library
Algona Pacific Library
Amanda Park Timberland Library
Applegate Branch Library
Arcata Branch Library
Ashland Public Library
Auburn Library
Bandon Public Library
Battleground Library
Bellevue Regional Library
Belmont Library
Bend Public Library
Black Diamond Library
Bleyhl Community Library
Blue Lake Branch Library
Bothell Regional Library
Boulevard Regional Library
Brownsville Public Library
Buena Library
Burien Library
Butte County Library
C. Giles Hunt Memorial Library
California State University, Chico
Camas Public Library
Canyonville Branch Library
Capitol Hill Library
Carnation Library
Carpenter Memorial Library
Cascade Foothills Library
Cascade Locks Library
Cascade Pacific Library Network
Cascade Park Library
Central Library
Central Washington University
Chemult Branch Library
Chetco Public Library
City of Eugene Library
City of Springfield Library
Clallam Bay Library
Clark College Cannell Library
Colorado State University Libraries
Columbia Gorge Community College Library
Coos Bay Public Library
Coquille Public Library
Corning City Library
Corvallis-Benton Public Library
Cottage Grove Public Library
Cottonwood Library
Covington Library
Curry County Public Library
Dallas Library
Del Norte County Library Dist
Des Moines Library
Douglas County Library System
Dufur Community Library
Dunsmuir Library
Duvall Library
Ellensburg Library
Entiat Public Library
Eugene Public Library
Everett Public Library
Evergreen State College
Fairview Columbia Library
Fairwood Library
Fall City Library
Fall River Library
Federal Way 320th Library
Federal Way Regional Library
Ferndale Branch Library
Flora M Laird Memorial Library
Forks Library
Fortuna Branch Library
Foster Library
Ft. Bragg Library
Ft. Jones Branch Library
Ft. Vancouver Regional Library
Garberville Branch
Glendale Branch Library
Gold Beach Public Library
Goldendale Library
Granger Library
Grants Pass Library
Gregory Heights Library
Gresham Library
Happy Camp Library
Harrah Library
Hazel M Lewis Library
Hillsdale Library
Holgate Library
Hollywood Library
Hood River County Library
Hoodsport Timberland Library
Hoopa Branch Library
Hoquiam Timberland Library
Humboldt County Library
Humboldt State University
Indiana University, Department of Religious Studies
Issaquah Library
Jackson Co Library System
Jacksonville Public Library
Jefferson County Library
Jefferson Public Library
Josephine County Library
Keizer Reading Connection Library
Kenmore Library
Kent Regional Library
Kingsgate Library
Kirkland Library

Klamath County Library
Klamath Union High School
Lacey Timberland Library
Lake Forest Park Library
Lake Hills Library
Lakeport Library
Lakeview County Library
Land-Air-Water Law Center
Lane Community College Library
Lapine Public Library
Lebanon Library
Lyons Public Library
Mabton Library
Maple Valley Library
Mazama High School
McCloud Branch Library
McKinleyville Branch
Medford Library
Mercer Island Library
Middletown Library
Midland Library
Mildred Whipple Library
Mill City Public Library
Modoc County Library
Montague Branch Library
Mosier Public Library
Moxee Library
Mt Shasta Library
Muckleshoot Library
Myrtle Creek Branch Library
N. Bonneville Library
N. State Coop Library
Naches Library
Newport Way Library
Nile Library
North Bend Library
North Bend Public Library
North Central Regional Library System
North Portland Library
Northwest Library
Oak Run Community Library
Oakland Branch Library
Oakridge City Library
Olympia Timberland Library
Oregon Institute of Technology
Oregon Natural Heritage Information Center
Oregon State University
Oregon State University Botany Dept
Oregon State University Extension Office
O.S.U. Lichen & Bryophyte Study Group
Orland City Library
Parkdale Library
Peninsula College
Plumas County Library
Port Angeles Library
Port Townsend Library
Quinney Natural Resources Library
Red Bluff Library
Redbud Library
Redmond Public Library
Redmond Regional Library
Reedsport Branch Library
Richmond Beach Library
Riddle Branch Library
Ridgefield Library
Rio Dell Branch Library
Rockwood Library
Roseburg Library
Roslyn Library
Round Valley Public Library
Ruch Branch Library
Salem Public Library
Salem State College, Department of Geography
Sammamish Library
SE Yakima Library
Seattle Public Library
Selah Library
Sellwood-Moreland Library
Sequiam Library
Shasta Bible College Library
Shasta College Library
Shasta County Library
Shasta Lake Gateway Library
Shelton Timberland Library
Shingletown Library
Shoreline Library
Simpson College
Siskiyou County Library
Sisters Public Library
Siuslaw Public Library District
Skykomish Library
Skyway Library
Snoualmie Library
Southern Oregon University Library
Springfield Public Library
St. Johns Library
State of Illinois University
Stayton Public Library
Stevenson Library
Summit View Library
Sunnyside Library
Sunriver Area Public Library
Susanville District Library
Southwestern Oregon Community College Library
Sweet Home Public Library
Tehama County Library
Terrace Heights Library
The Dalles-Wasco County Library
Three Creeks Library
Tieton Library
Tillamook County Library
Toppenish Library
Trinidad Branch Library
Trinity County Library

Tukwila Library
Tulelake Library
Ukiah Library
Union Gap Library
University of Oregon Library, Documents Section
University of Tennessee, Department of Biology
University of Washington, Forestry Library
University of Washington, Government Publications
University of California Physics Dept
University of Oregon
University of Oregon Library
University of Washington
Upper Lake Library
Valley View Library
Vancouver Library
Vashon Library
Washington State University Library
Wapato Library
Washington Natural Heritage Program
Washougal Library
West Salem Library
White Center Library
White Salmon Valley Library
White Swan Library
Willits Library
Willow Creek Branch Library
Willows Public Library
Winston Branch Library
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Woodland Library
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Woodstock Library
World Botanical Association
Yakima Valley Regional Library
Yoncalla Branch Library
Yreka Library
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Gloria Wiemann
Robert A Witzeman
Jan Wroncy
Richard Zeller
George Zuk

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(Replace the entire section on pages 331-332 with:)

Appendix 5S

Draft Supplement to the January, 2004 BIOLOGICAL EVALUATION for Federal Threatened, Endangered, and Proposed Species and Forest Service Sensitive Species

and an Analysis of Effects on Bureau of Land Management Special Status Species

Draft Supplement to the 2004 Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines July 2006

Lead Agencies: **Forest Service - U.S. Department of Agriculture**
Bureau of Land Management - U.S. Department of the Interior

Introduction

Insert or replacement text, tables, and figures are provided below. Unless replaced as described below, existing text, figures, and tables from the 2004 FSEIS remain unchanged. Page numbers are in reference to Volume II of the 2004 FSEIS.

(In volume II, at the end of the first paragraph on page 117, insert:)

A lawsuit by the Northwest Ecosystem Alliance and others resulted in an August, 2005 decision by the District Court of the Western District of Washington identifying three deficiencies in the 2004 FSEIS. A Notice of Intent to prepare a Supplement to the 2004 FSEIS to address these three deficiencies was published in the Federal Register on December 12, 2005. The Draft Supplement supplies only the missing information and new information that has become available since the 2004 analysis. The Purpose and Need, Proposed Action, and Alternatives remain unchanged. The 2006 supplement and the 2004 FSEIS together present the environmental consequences of the alternaties described in the 2004 FSEIS.

Proposed, Threatened, and Endangered Species and Designated or Proposed Critical Habitat

Northern Spotted Owl (Strix occidentalis caurina)

Background and Affected Environment.

(In Volume II, after the first partial paragraph at the top of page 121, insert:)

Anthony et al. (2004) indicated that NSO populations were doing poorest in Washington, with precipitous declines on all four study areas. The number of populations that declined, and the rate at which they declined, were noteworthy (Anthony et al. 2004). In northern Oregon, NSO population declines were noted in all three study areas. The declines in northern Oregon were less than those in Washington, except in the Warm Springs study area, where the decline was comparable to those in Washington (Anthony et al. 2004). The NSO has continued to decline in the northern portion of its range, despite the presence of a high proportion of protected habitat on federal lands in that area. Although Courtney et al. (2004) indicated that population declines of the NSO over the past 14 years were expected, they concluded that the accelerating downward trends on some study areas in Washington where little timber harvest was taking place suggest that something other than timber harvest is responsible for the decline. Anthony et al. (2004) stated that determining the cause of this decline was beyond the scope of their study, and that they could only speculate among the numerous possibilities, including competition from Barred Owls, loss of habitat from wildfire, timber harvest including lag effects from prior harvest, poor weather conditions, and defoliation from insect infestations. Considering the fact that the NSO is a predator species, Anthony et al. (2004) also noted the complexities of relationships of prey abundance on predator populations, and identified declines in prey abundance as another possible reason for declines in apparent survival of NSO.

In southern Oregon and northern California, NSO populations were more stationary than in Washington (Anthony et al. 2004). The fact that NSO populations in some portions of the range were stationary was not expected within the first ten years, given the general prediction of continued declines in the population over the first several decades of Northwest Forest Plan (NWFP) implementation (Lint 2005). The cause of the better demographic performance on the southern Oregon and northern California study areas, and the cause of greater than expected declines on the Washington study areas are both unknown (Anthony et al. 2004). Courtney et al. (2004) noted that a rangewide population

decline was not unexpected during the first decade, nor was it a reason to doubt the effectiveness of the core NWFP conservation strategy.

Lint (2005) indicated that loss of NSO habitat did not exceed the rate expected under the NWFP, and that habitat conditions are no worse, and perhaps better than expected. In particular, the percent of existing NSO habitat removed by harvest during the first decade was less than expected. Courtney et al. (2004) indicated that models of habitat growth suggest that there is significant ingrowth and development of habitat throughout the federal landscape. Courtney et al. (2004) also noted that management of matrix habitat has had a lower impact on NSO populations than predicted. Owls are breeding in substantial numbers in some matrix areas. The riparian reserve strategy and other habitat management guidelines for the matrix area appear to preserve more, better, and better-distributed dispersal habitat than earlier strategies, and there is no evidence to suggest that dispersal habitat is currently limiting to the species in general (Courtney et al. 2004).

Anthony et al. (2004) noted declining NSO populations on some study areas with little harvest, and stationary populations on other areas with consistent harvest of mature forest. No simple correlation was found between population declines and timber harvest patterns (Courtney et al. 2004). Because it was not clear if additional protection of NSO habitat would reverse the population trends, and because the results of their study did not identify the causes of those trends, Anthony et al. (2004) declined to make any recommendations to alter the current NWFP management strategy.

Reductions of NSO habitat on federal lands are lower than those originally anticipated by the Service and the NWFP (Courtney et al. 2004). The threat posed by current and ongoing timber harvest on federal lands has been greatly reduced since 1990, primarily because of the NWFP (Courtney et al. 2004). The effects of past habitat loss due to timber harvest may persist due to time-lag effects. Although noting that it is probably having a reduced effect now as compared to 1990, Courtney et al. (2004) identified past habitat loss due to timber harvest as a current threat. The primary current source of habitat loss is catastrophic wildfire (Courtney et al. 2004). Although the total amount of habitat affected by wildfires has been small, there is concern for potential losses associated with uncharacteristic wildfire in a portion of the species range. Lint (2005) indicated that the NWFP recognized wildfire as an inherent part of managing NSO habitat in certain portions of the range. Courtney et al. (2004) stated that the risk to NSO habitat due to uncharacteristic stand replacement fires is sub-regional, confined to the dry eastern and to a lesser extent the southern fringes of the NSO range. Wildfires accounted for 75 percent of the natural disturbance loss of habitat estimated for the first decade of NWFP implementation (Courtney et al. 2004). Lint (2005) cautioned against relying solely on the repetitive design of the conservation strategy to mitigate effects of catastrophic wildfire events, and highlighted the potential to influence fire and fire effects through active management.

Anthony et al. (2004) indicated that there is some evidence that Barred Owls may have had a negative effect on NSO survival in the northern portion of the NSO range. They found little evidence for such effects in Oregon or California. The
threat from Barred Owl competition has not yet been studied to determine whether it is a cause or a symptom of NSO population declines, and the reports indicate a need to examine threats from Barred Owl competition.

Lint (2005) reported that the results from the first 10 years of population monitoring under the Northwest Forest plan were both expected and unexpected. Results from the realized population change analysis for 4 of the 10 demographic study areas, all in southern Oregon, indicated stationary populations in all of those study areas. The fact that owl populations in some portions of the range were stationary was not expected just ten years into the plan given the general prediction of continued declines in the population in the first several decades of implementation.

Lint (2005), also reported that the populations were declining on 9 of 13 demographic study areas and the average decline across all demographic study areas was 3.7 percent per year. The findings during the ten year period also identified that survival and rate of population change declined in all four demographic study areas within Washington.

Forest Service Sensitive and BLM Special Status Species

Background and Affected Environment.

(At the end of the first paragraph in this section, in the lower half of page 130, insert:)

Table 5-3 has been added at the end of this appendix to show species included in the Forest Service and BLM's Special Status Species Programs since the 2004 FSEIS. Of the 296 Survey and Manage species, 146 are now included in one or more of the Agencies' Special Status Species Programs.

References

(In Volume II, in this section on page 136, insert:)

Anthony et. al. 2004. Status and Trends in Demography of Northern Spotted Owls, 1985-2003. Final Report to the Regional Interagency Executive Committee. On file with: Regional Ecosystem Office, 333 SW First Avenue, Portland, OR 97204. 180 p.

Courtney et. al. 2004. Scientific Evaluation of the Status of the Northern Spotted Owl. Sustainable Ecosystems Institute, Portland, OR. 52p.

Lint, Joseph, tech. coord. 2005. Northwest Forest Plan – The First 10 Years (1994-2003): Status and Trends of Northern Spotted Owl Populations and Habitat. Gen. Tech. Rep. PNW-GTR-648. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 176 p.

(*At the end of Appendix 5 on page 154, insert:)*

Table 5-2.1S. 2006 Sensitive Species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) and Special Status Species for BLM Oregon/Washington and California within the Northwest Forest Plan area (Range of the Northern Spotted Owl) Also on Survey and Manage.

TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Special Status Species Programs**			
		BLM OR/WA[1]	**BLM CA**	**FS R-6**	**FS R-5**
FUNGI					
Albatrellus avellaneus		SS	-	SS	-
Albatrellus caeruleoporus		BT	SS	-	-
Albatrellus ellisii		BT	SS	SS-W	-
Albatrellus flettii		-	SS	-	-
Alpova alexsmithii		SS	-	-	-
Arcangeliella camphorata (*Arcangeliella* sp. nov. #Trappe 12382; *Arcangeliella* sp. nov. #Trappe 12359)		SS	-	-	-
Boletus haematinus		-	SS	-	-
Boletus pulcherrimus		SS	-	SS	SS
Bridgeoporus nobilissimus (Oxyporus nobilissimus)		SS	-	SS	SS
Choiromyces venosus		BT	SS	-	-
Clavariadelphus ligula		-	SS	-	-

Table 5-2.1S. 2006 Sensitive Species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) and Special Status Species for BLM Oregon/Washington and California within the Northwest Forest Plan area (Range of the Northern Spotted Owl) Also on Survey and Manage.

TAXA GROUP ***Species*** *Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Special Status Species Programs**			
	BLM OR/WA[1]	**BLM CA**	**FS R-6**	**FS R-5**
Clavariadelphus occidentalis (*Clavariadelphus pistillaris*)	-	-	SS-W	-
FUNGI				
Clavariadelphus sachalinensis	BT	-	SS-W	-
Clavulina castanopes v. *lignicola* (*Clavulina ornatipes*)	BT	SS	-	-
Clitocybe subditopoda	BT	SS	-	-
Collybia racemosa	-	SS	-	SS
Cordyceps ophioglossoides	BT	SS	-	-
Cortinarius barlowensis (syn. *Cortinarius azureus*)	BT	-	SS-O	-
Cudonia monticola	BT	-	SS	SS
Dermocybe humboldtensis	SS	SS	-	-
Destuntzia rubra	SS	-	-	-
Entoloma nitidum (Rhodocybe nitida)	-	SS	-	-
Gastroboletus imbellus	SS	-	-	-
Gomphus kauffmanii	BT	-	SS	-
Gymnomyces nondistincta (*Martellia* sp. nov. #Trappe 649)	SS	-	-	-
Gymnopilus punctifolius	BT	SS	-	-
Gyromitra californica	BT	-	SS	-
Hydropus marginellus (Mycena marginella)	BT	SS	-	-
Leucogaster citrinus	BT	SS	SS	
Martellia idahoensis	SS	-	-	-
Mycena quinaultensis	BT	SS	-	-
Octavianina macrospora	SS	-	-	-
Otidea smithii	BT	-	SS	SS
Phaeocollybia attenuata	BT	-	SS	-
Phaeocollybia californica	SS	SS	SS-O	-
Phaeocollybia dissiliens	BT	-	SS-O	-
Phaeocollybia fallax	-	-	SS-W	-
Phaeocollybia gregaria	SS	-	-	-
Phaeocollybia olivacea	SS	SS	SS-O	SS
Phaeocollybia oregonensis (syn. *Phaeocollybia carmanahensis*)	SS	-	SS	-
Phaeocollybia piceae	-	SS	SS	-
Phaeocollybia pseudofestiva	BT	SS	SS	-
Phaeocollybia scatesiae	BT	SS	SS	-
Phaeocollybia sipei	BT	-	SS-O	-
Phaeocollybia spadicea	BT	SS	SS	-
Polyozellus multiplex	BT	SS	-	-
Ramaria amyloidea	BT	SS	SS	-
Ramaria araiospora	-	-	SS-W	-
Ramaria aurantiisiccescens	BT	SS	SS	-
Ramaria cyaneigranosa	-	SS	SS-W	-
Ramaria gelatiniaurantia	BT	-	SS	-
Ramaria largentii	BT	SS	SS	-
Ramaria rubrievanescens	BT	-	SS-W	-

Table 5-2.1S. 2006 Sensitive Species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) and Special Status Species for BLM Oregon/Washington and California within the Northwest Forest Plan area (Range of the Northern Spotted Owl) Also on Survey and Manage.

TAXA GROUP ***Species*** *Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Special Status Species Programs**			
	BLM OR/WA[1]	**BLM CA**	**FS R-6**	**FS R-5**
Ramaria rubripermanens	-	-	SS-W	-
Ramaria spinulosa var. *diminutiva* (*Ramaria spinulosa*)	SS	-	-	-
FUNGI				
Ramaria stuntzii	-	-	SS-W	-
Rhizopogon chamaleontinus (*Rhizopogon* sp. nov. #Trappe 9432)	SS	-	-	-
Rhizopogon ellipsosporus (*Alpova* sp. nov. # Trappe 9730)	SS	-	-	-
Rhizopogon exiguus	SS	-	-	-
Sarcodon fuscoindicus	BT	SS	SS-W	-
Sowerbyella rhenana (Aleuria rhenana)	BT	SS	SS	SS
Sparassis crispa	-	SS	-	-
Spathularia flavida	-	SS	SS-W	-
Thaxterogaster pavelekii (*Thaxterogaster* sp. nov. #Trappe 4867, 6242, 7427, 7962, 8520)	SS	-	-	-
Tricholomopsis fulvescens	BT	-	-	SS
LICHENS				
Bryoria pseudocapillaris	SS	SS	SS	-
Bryoria spiralifera	SS	SS	SS-O	-
Bryoria subcana	As	-	-	-
Calicium adspersum	As	-	-	SS
Cetrelia cetrarioides	BT	-	SS-W	-
Chaenotheca subroscida	-	-	SS	-
Collema nigrescens	-	-	SS-W	-
Dendriscocaulon intricatulum	-	SS	SS-W	-
Dermatocarpon luridum	BT	-	SS	-
Heterodermia sitchensis	As	-	-	-
Hypogymnia duplicata	BT	-	SS-O	-
Hypotrachyna revoluta	As	-	SS	-
Leptogium burnetiae var. *hirsutum*	-	-	SS	-
Leptogium cyanescens	BT	-	SS	-
Lobaria linita	As	-	SS-O	-
Lobaria oregana	-	SS	-	-
Microcalicium arenarium	As	-	-	-
Nephroma bellum	-	SS	SS-W	-
Nephroma occultum	BT	-	SS	-
Niebla cephalota	As	SS	SS	-
Pannaria rubiginosa	As	SS	SS	-
Peltigera pacifica	-	-	SS	-
Platismatia lacunosa	BT	-	SS-W	-
Pseudocyphellaria rainierensis	BT	-	SS	-
Teloschistes flavicans	As	SS	SS-O	-
Tholurna dissimilis	As	-	SS	-
Usnea longissima	BT	SS	SS	SS
BRYOPHYTES				

Table 5-2.1S. 2006 Sensitive Species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) and Special Status Species for BLM Oregon/Washington and California within the Northwest Forest Plan area (Range of the Northern Spotted Owl) Also on Survey and Manage.

TAXA GROUP ***Species*** *Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Special Status Species Programs**			
	BLM OR/WA[1]	**BLM CA**	**FS R-6**	**FS R-5**
Buxbaumia viridis	-	SS	-	SS
Diplophyllum plicatum	As	-	-	-
Herbertus aduncus	As	-	-	-
BRYOPHYTES				
Iwatsukiella leucotricha	As	-	SS	-
Kurzia makinoana	As	-	-	-
Orthodontium gracile	-	SS	-	-
Ptilidium californicum	-	SS	-	SS
Rhizomnium nudum	As	-	SS-O	-
Schistostega pennata	As	-	SS	-
Tetraphis geniculata	As	SS	SS	-
Tritomaria exsectiformis	As	-	-	-
VERTEBRATES				
Larch Mountain salamander *Plethodon larselli*	As	-	SS	-
Shasta salamander *Hydromantes shastae*	-	SS	-	SS
Siskiyou Mountains salamander *Plethodon stormi*	SS	-	SS-O	SS
Van Dyke's salamander *Plethodon vandykei*	-	-	SS-W	-
Great Gray Owl *Strix nebulosa*	-	-	SS-W	SS
Oregon Red Tree Vole *Arborimus longicaudus*, In xeric and northern mesic portion of its range	SS[2]	-	SS[2]	-
MOLLUSKS				
Cryptomastix devia	SS	-	SS	-
Cryptomastix hendersoni	-	-	SS	-
Deroceras hesperium	SS	-	SS	-
Fluminicola n. sp. 3	SS	-	SS-O	-
Fluminicola n. sp. 11	SS	-	-	-
Fluminicola seminalis	-	-	-	SS
Helminthoglypta talmadgei	-	SS	-	-
Hemphillia burringtoni	-	-	SS-W	-
Hemphillia glandulosa	BT	-	SS-W	-
Hemphillia malonei	BT	-	SS-W	-
Hemphillia pantherina	-	-	SS-W	-
Juga (O) n. sp. 2	-	-	SS-O	-
Lyogyrus n. sp. 1	-	-	SS	-
Lyogyrus n. sp. 2	-	-	SS	-
Monadenia chaceana	SS	SS	SS-O	-
Monadenia fidelis minor	-	-	SS	-
Monadenia troglodytes troglodytes	-	-	-	SS
Monadenia troglodytes wintu	-	-	-	SS
Oreohelix n. sp.	-	-	SS-W	-
Pristiloma arcticum crateris	SS	-	SS-O	-
Prophysaon coeruleum	-	-	SS-W	SS
Trilobopsis roperi	-	-	-	SS

Table 5-2.1S. 2006 Sensitive Species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) and Special Status Species for BLM Oregon/Washington and California within the Northwest Forest Plan area (Range of the Northern Spotted Owl) Also on Survey and Manage.

TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Special Status Species Programs**			
		BLM OR/WA[1]	**BLM CA**	**FS R-6**	**FS R-5**
Trilobopsis tehamana		-	SS	-	SS
Vertigo n. sp.		-	-	SS-W	-
Vespericola pressleyi		-	SS	-	SS
Vespericola shasta		-	-	-	SS
VASCULAR PLANTS					
Bensoniella oregana		SS	-	SS-O	SS
Botrychium minganense		BT	-	SS-O	SS
Botrychium montanum		As	-	SS-O	SS
Coptis asplenifolia		-	-	SS-W	-
Coptis trifolia		As	-	SS	-
Corydalis aquae-gelidae		SS	-	SS	-
Cypripedium fasciculatum		As	SS	SS	SS
Cypripedium montanum		BT	SS	-	SS
Eucephalus vialis (Aster vialis)		SS	-	SS-O	-
Galium kamtschaticum		-	-	SS	-

[1]BLM OR/WA list is inclusive of any Oregon Natural Heritage Program List 1 or List 2 species. For effects analysis and disclosure, Bureau Tracking species are not included because site management or pre-project clearances are not required. No lands are managed in the BLM in Washington under the Northwest Forest Plan, therefore, Survey and Manage species that are on the Special Status Species Program on BLM WA may or may not be listed in table 2-5.
[2]Species recommended for inclusion as Special Status species in the northwestern Oregon coast area only (north of Highway 20, west of the Willamette Valley).

As=Bureau Assessment
BT=Bureau Tracking
SS=Bureau Sensitive or Forest Service Sensitive
SS-O=FS Sensitive in Oregon
SS-W=FS Sensitive in Washington
Hyphens (-) indicate not included, may result from species not occurring in the state.

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